Lecture Note #18: PivotTables Part #4

BUSI 201: Business Data Analysis

Fall 2023

Topic 1. PivotTables: Slicers

Last lecture, we talked about various ways we can apply filters to analyze data using PivotTables. However, if we must switch between different filters many times or if we want to apply filters with many conditions, ordinary filtering may not be the best tool at our disposal. In such scenarios, we can use slicers to apply more complicated filters, and switch between filters rapidly. Navigate to `PIVOT-SLICER` in the workbook `BUSI201-LEC18-Workbook.xlsx`.

Suppose we are interested in the total transaction amount by payment method - state. That is, each row variable should be the field `State`, and the column variable should be the `Payment Method`, and each value should be the `Sum of Total`. Suppose also that we are interested in this information, but by each specific item as well. Then we may achieve this goal by adding `Item` as the filter variable. Following this line of thought, we should be able to create the PivotTable depicted in Figure 1.
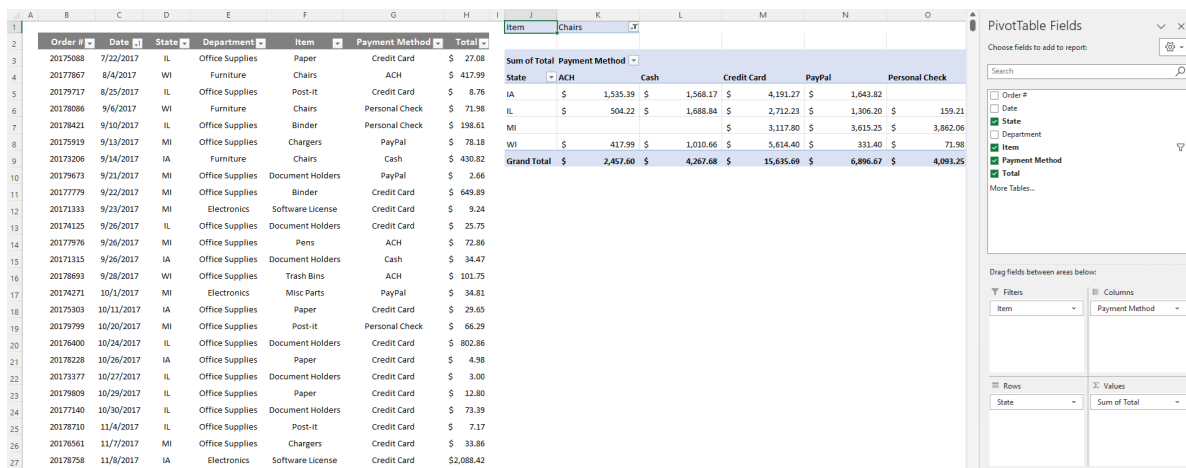

Figure 1: Individual Filters

The issue with this method is that rotating between different filters is a bit awkward, as we must click and set new filters every time we want to move between filters. Another way to deal with this issue may be to add the `Item` field in either the columns or rows box. An example can be seen in Figure 2. Either method is not necessarily optimal, since the second option tends to generate a table that is too "wide" or "tall" to fit in one page. Here, we can make use of slicers to easily apply, and swap between filters.
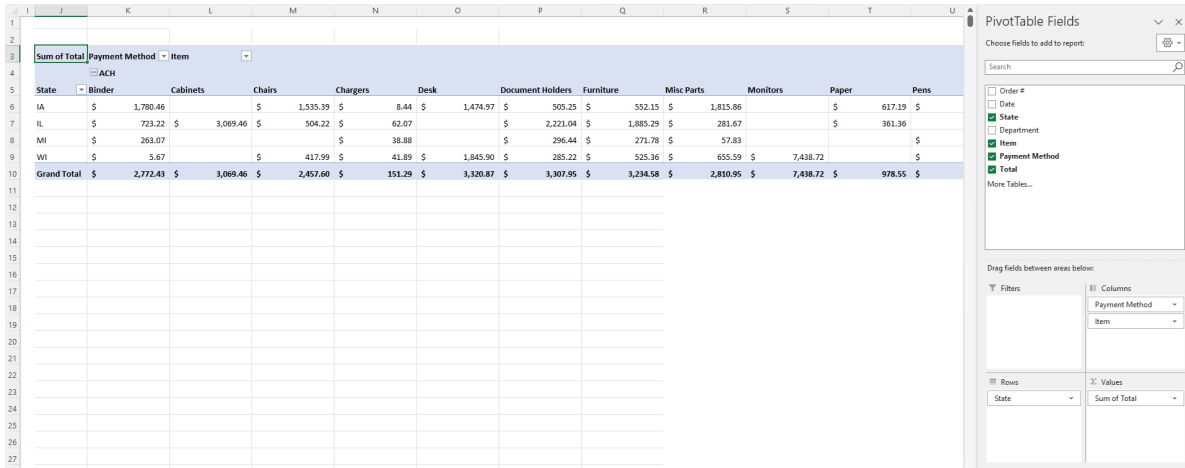
Figure 2: Creating Larger Tables

Applying Slicers

To apply slicers, click on the PivotTable, and navigate to `PivotTable Analyze`, and select `Insert Slicer`. Then, a new window should pop-up, with a list of all variables that are available in the dataset selected for the active PivotTable. Figure 3 shows us what this pop-up window should look like in the blue box. Lets see what slicers can do for us, by selecting the fields `Item` and `Department` to add as slicers, and select `Ok`.
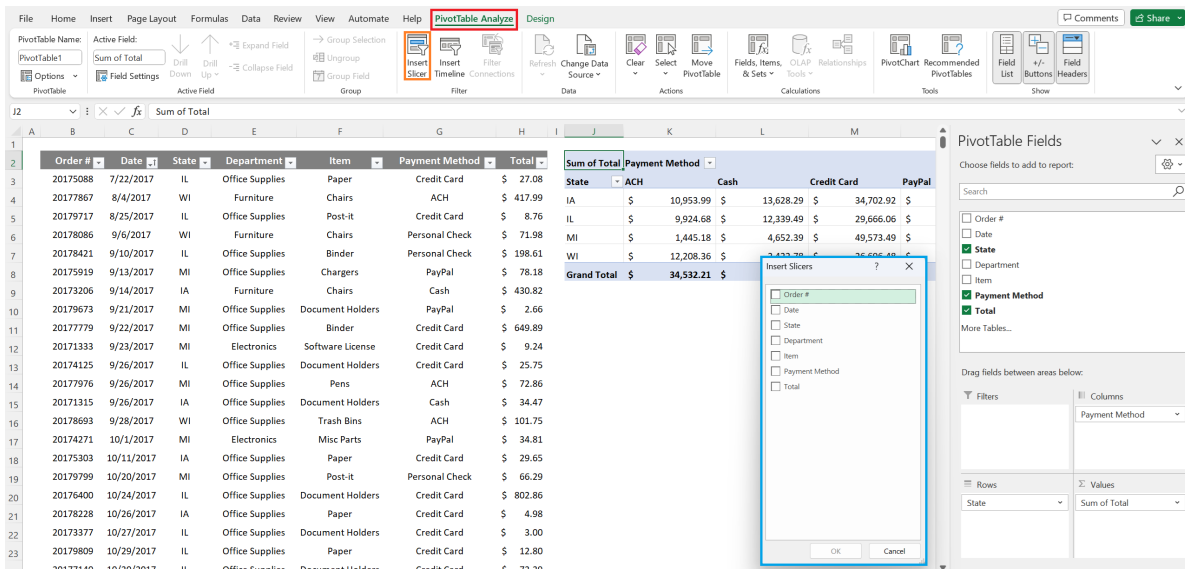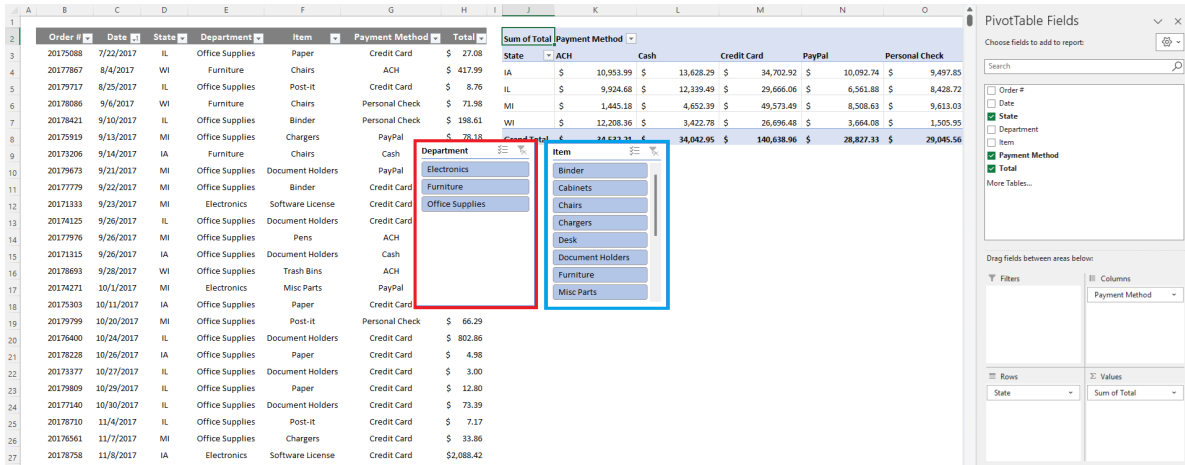

Figure 3: Inserting Slicers

Figure 4: Slicers: `Department` and `Item`

Figure 4 shows us what slicers look like in Excel. They are essentially control panels on a dashboard, which will automatically filter data. Suppose you wanted to see the state-payment method data for transactions on office supplies exclusively. Then, you can simply left click `Office Supplies` in the red box. Please see Figure 5 to see what happens when we apply the filter on `Electronics` using slicers.
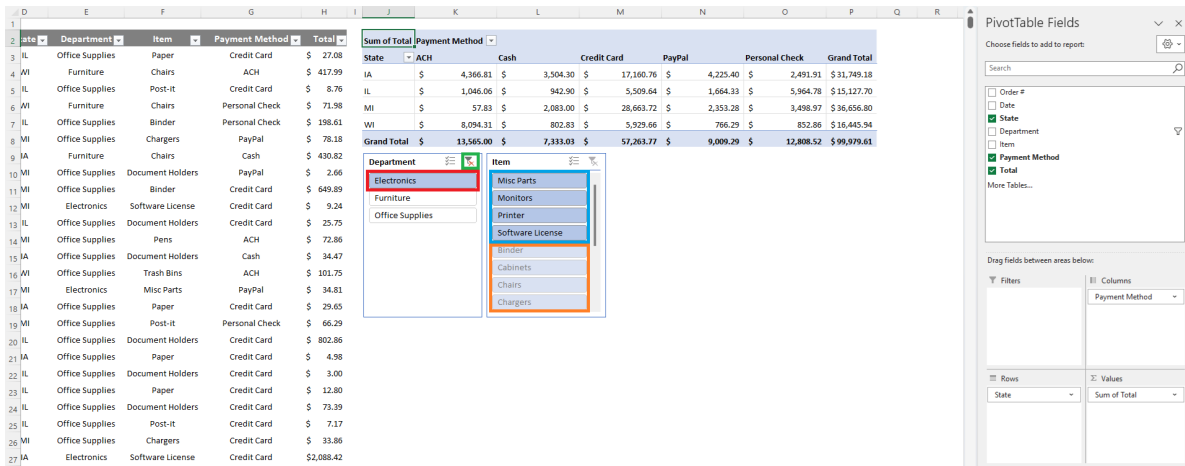

Figure 5: Slicers: `Electronics` Filtered

Notice that the slicers also tell us which of the variables are subcategories of `Electronics`, which show up in the blue box. Meanwhile, the elements in the `Item` field that does not appear under the item `Electronics` will show up in the orange box, and will be faded out. To remove filters in slicers, click the `Clear Filter` icon on the top right corner of the slicer window.

Remove the "Faded" Items from View

In Figure 5, we noticed that elements are faded out when they do not survive the filtering. We may also set up Excel so that these terms are not faded out, but hidden from view completely.
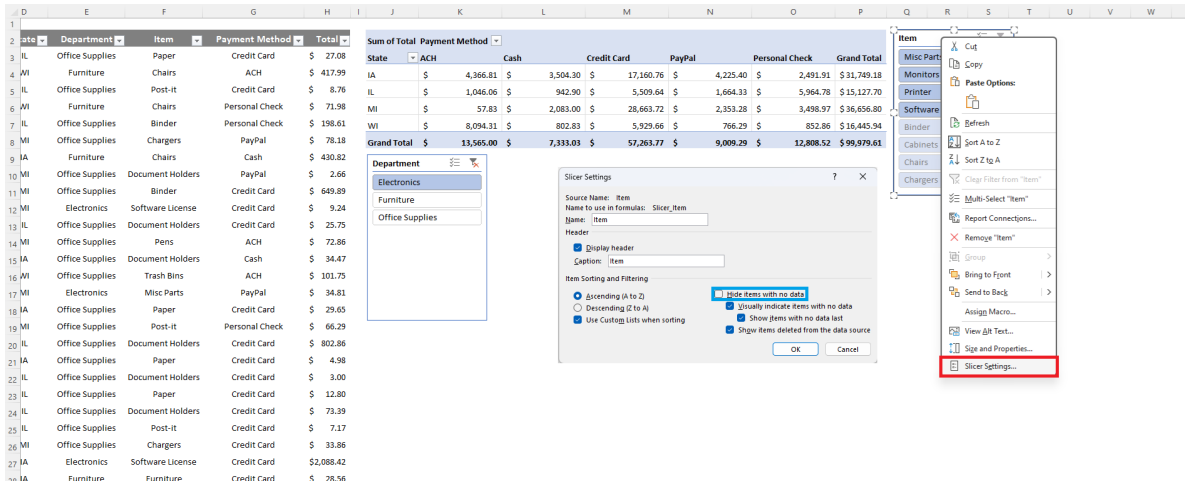

Figure 6: Slicers: Hiding Elements with no Data

See Figure 6. Select the slicer window with items that are faded out, right click, and select `Slicer Settings`. Then in the pop-up window, select the box `Hide items with no data`. The results are shown in Figure 7. Notice that the previously "faded" elements you can see in Figure 5 no longer appears.
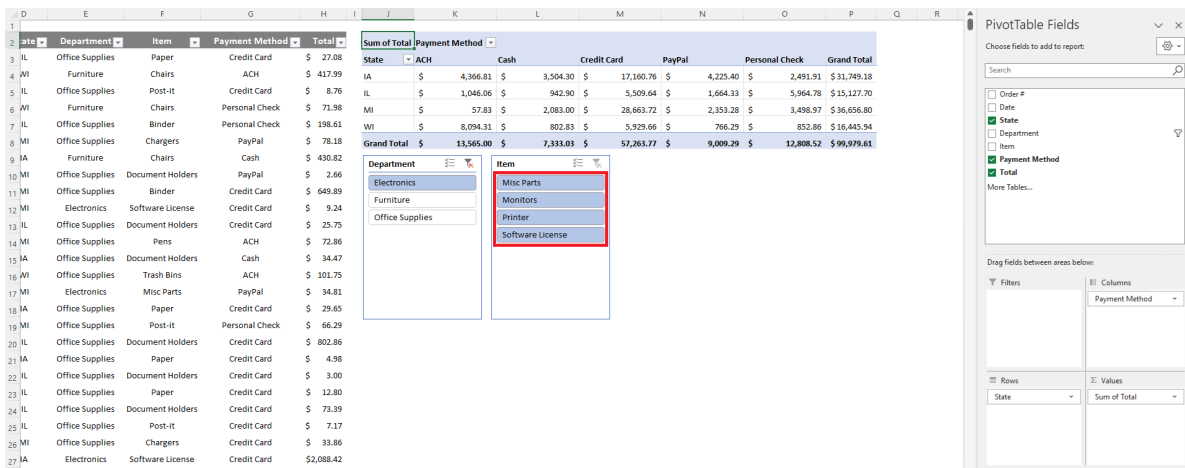

Figure 7: Slicers: Hiding Elements with no Data

Topic 2. PivotTables: Timelines

Another filtering tool that is quite useful is timelines. While slicers act as ordinary filters, timeline filters are specifically used to filter data based on dates.
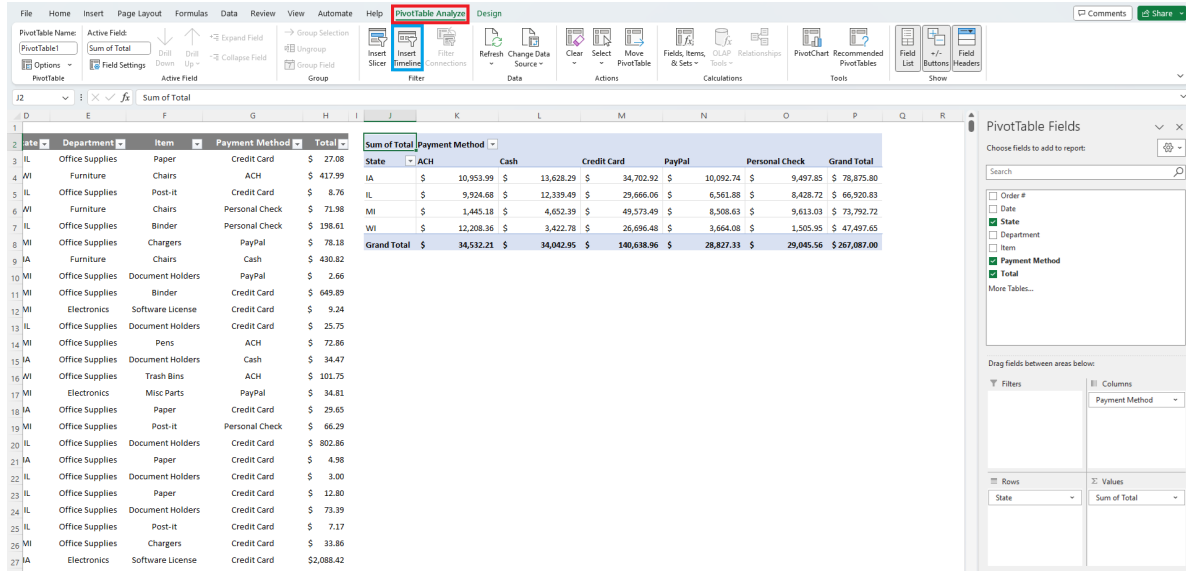

Figure 8: Timeline: Applying Timelines

To apply timeline filters, select the PivotTable, and navigate to the `PivotTable Analyze` tab. Then, select `Insert Timeline`, select the time variable in the pop-up window in the orange box.

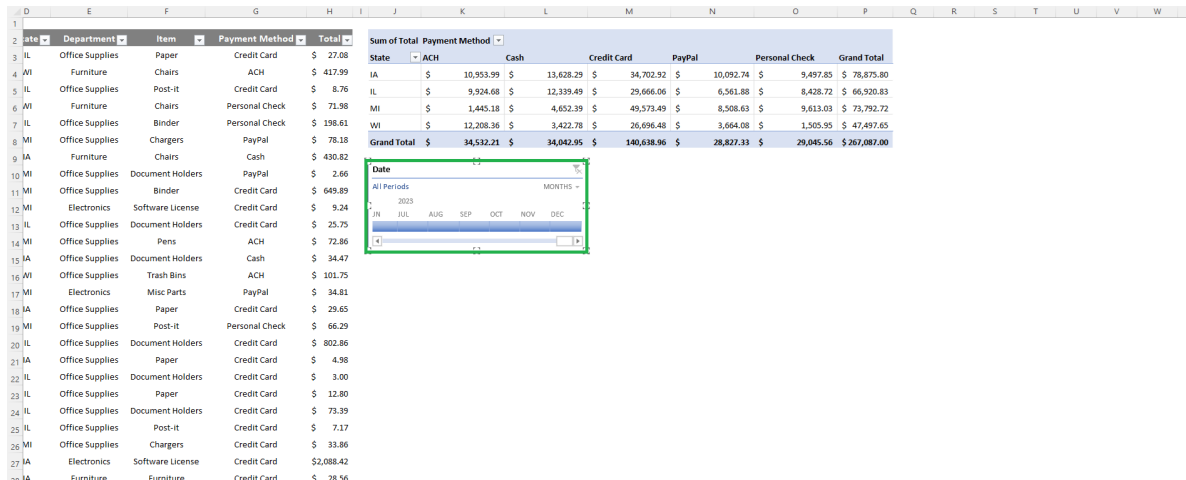Figure 9: Timeline: Applied Timelines

Then, a timeline filter resembling the one in the green box in Figure 9 will be added to the worksheet. We can use this timeline to filter our data based on dates.

We can use the timeline filter to check the state-payment method table for transactions between certain periods. For instance, if you manipulate the filter as seen in Figure 10.
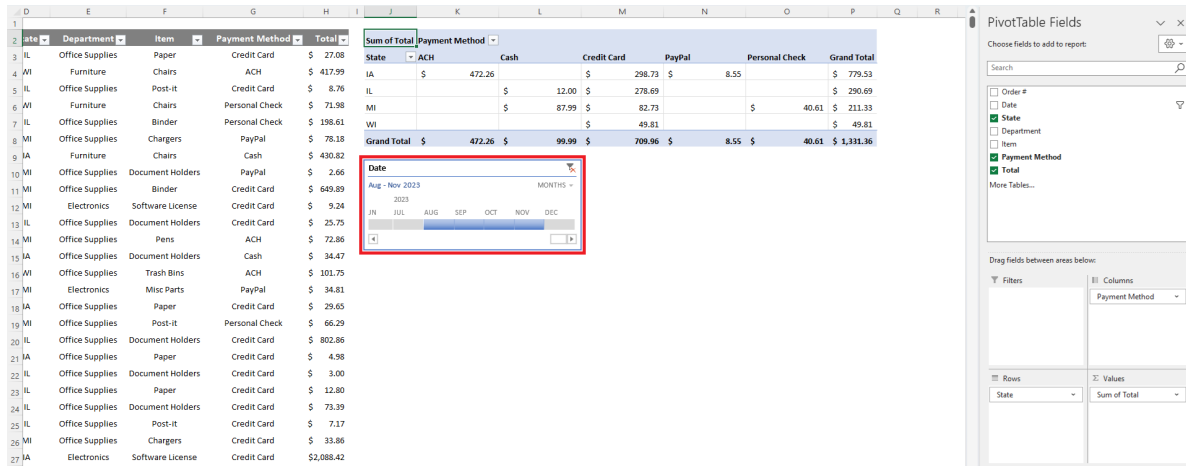

Figure 10: Timeline: Aug 2023 to Nov 2023

One critical weakness of this approach is that we can only filter contiguous periods along time. That is, if we wanted to filter the data for August 2023, and October 2023, leaving out the data from September 2023, we can't rely on timeline filters.

To achieve this goal, we must rely on slicers, and include dates into the PivotTable. If the date variable does not automatically group itself, group the dates by years and months. Then, add slicers based on `Years(Date)` and `Months(Date)` as shown in Figure 11.
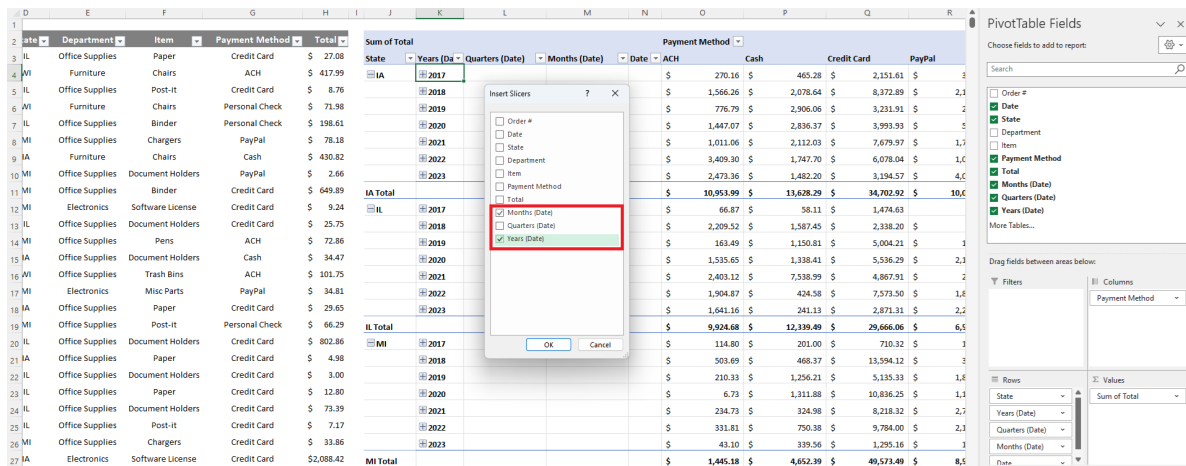

Figure 11: Timeline: Adding Dates to PivotTables

Figure 12: Date Filters using Slicers

Then, select date based filters as shown in Figure 12. Then, we can create the PivotTable of state-payment method based on data from two months that are not contiguous. We can easily expand this to see only information on August of every year by removing the filter on years, and selecting Aug in the month slicer.

Topic 3. PivotTables: Slicer Filters Across PivotTables

Another filtering technique that we will be learning today is how to apply a single slicer filter across multiple different PivotTables simulatneously. Using the same data in worksheet `PIVOT-SLICER`, create two PivotTables in a new worksheet. One should have `State` as the row variable, and `Payment Method` as the column variable, with `Total` sales as the cell values. The other should have `Item` as the row variable, `Payment Method` as the column variable, with `Total` sales as the cell values. Then, create slicers using any of the two PivotTables.

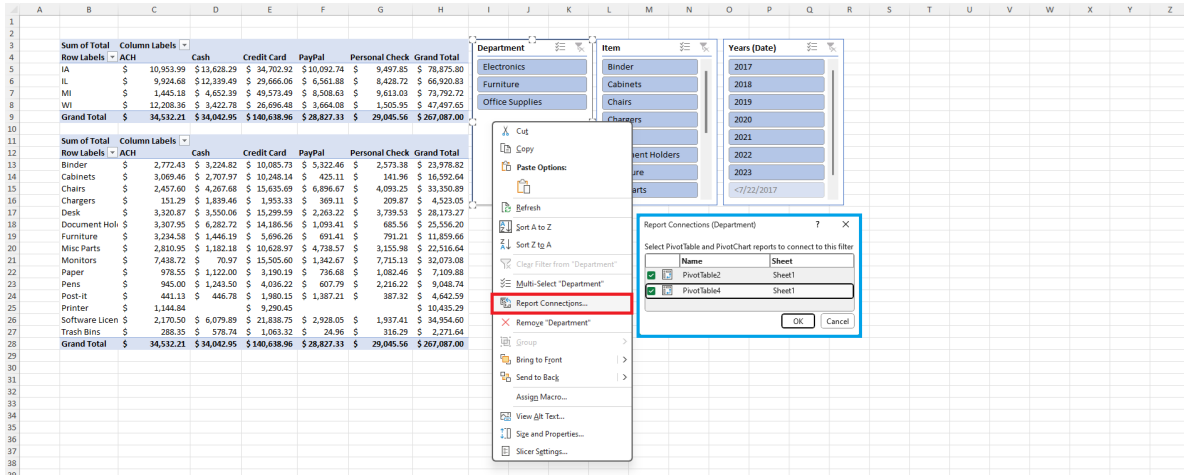Figure 13: Connecting Reports

Select one of the slicers, right click, and select `Report Connections`. Then, select all tables that you want to filter with this single slicer, as shown in the blue box in Figure 13. Repeat this process for all three slicers, then we will be able to filter data on both PivotTables with a single slicer setup. This connection will work only if the PivotTables we are linking via one slicer originates from the exact same data, or the same table.

Topic 4. PivotCharts

While not as frequently used as PivotTables, another function of Excel allows us to create charts automatically, following the same format as PivotTables. We will stick to the worksheet that we have been working with, `PIVOT-SLICER`.
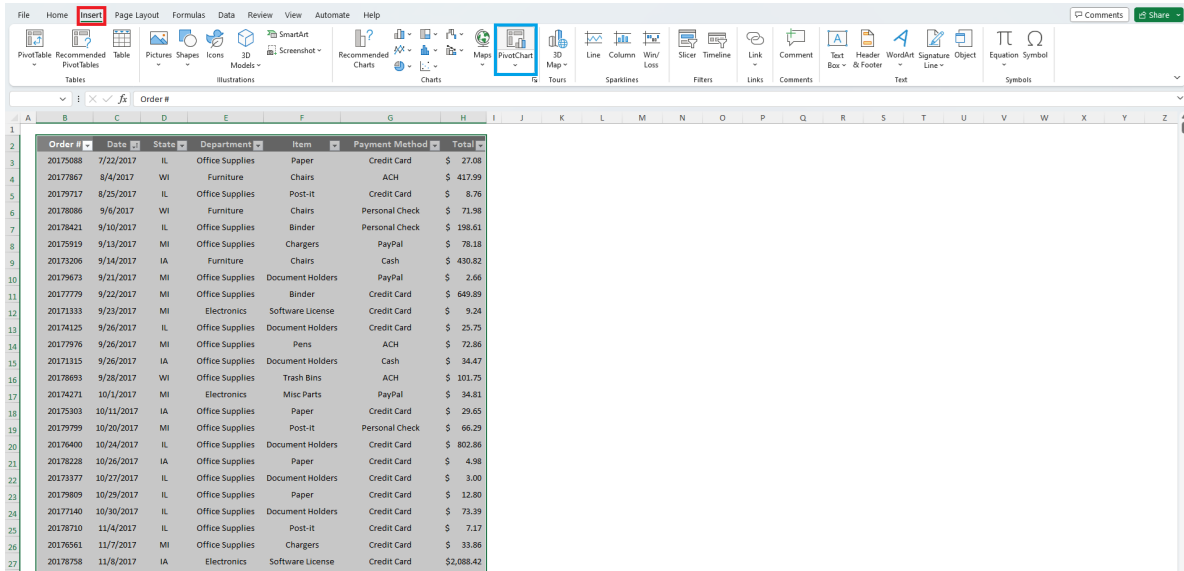

Figure 14: Inserting PivotCharts

Inserting PivotCharts follows nearly the same logic as PivotTables. Select the data, navigate to `Insert`, and select `PivotChart`. Constructing the PivotChart follows the same drag-and-drop format shown in Figure 15. Here, we plotted a chart that shows the composition of each department's sale by payment method.
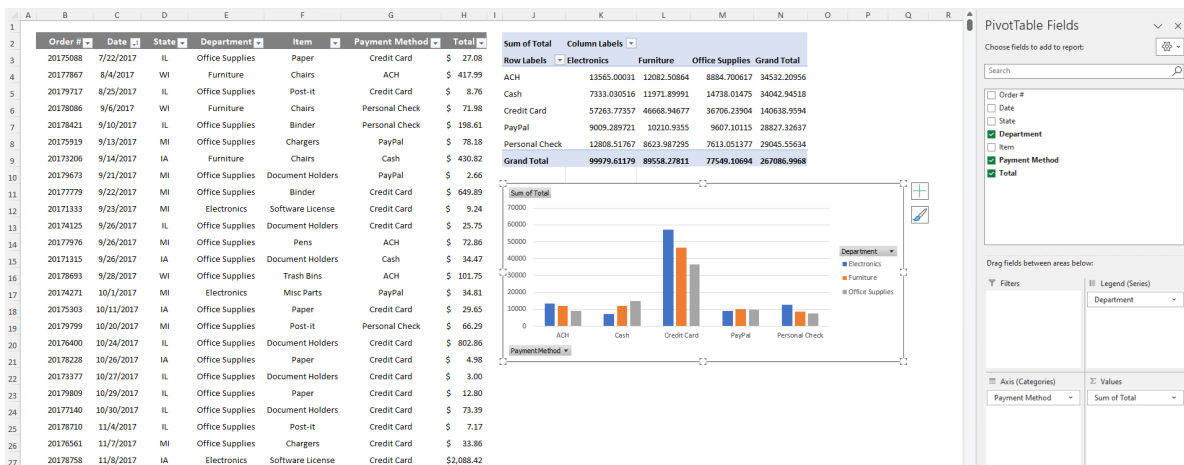

Figure 15: Inserting PivotCharts

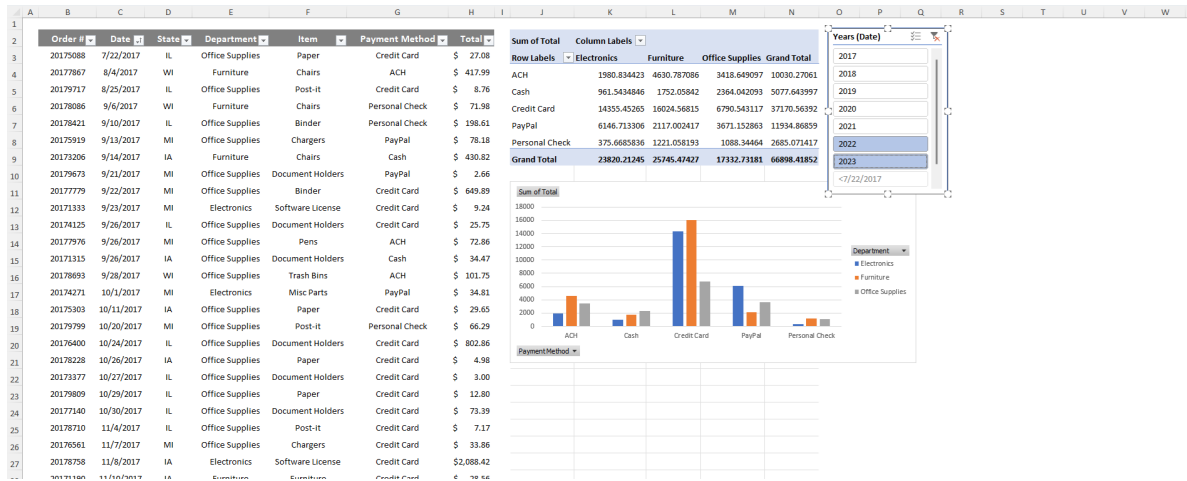We can use the same tools that we have been using in PivotTables, such as slicers and timelines. See the following figure for an example of slicers being applied in PivotCharts.

Figure 16: Slicers in PivotCharts