Lecture Note #17: PivotTables Part #4

BUSI 201: Business Data Analysis

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-LEC17-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.

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1	Order #	Date 1	State 🔽	Department	ltem 🗖	Payment Method	Tota	Item	Chairs	л											
2	20175088	7/22/2017	IL	Office Supplies	Paper	Credit Card	\$ 27												Choose fields to add to report		⊗ ~
4	20177867	8/4/2017	wi	Furniture	Chairs	ACH	\$ 417	Sum of Total	ACH				Credit						Search		2
4	20179717	8/25/2017		Office Supplies	Post-it	Credit Card	\$ 8				Cash				PayPal		Personal Check				
5	20178086	9/6/2017	wi	Furniture	Chairs	Personal Check	\$ 71	IA	\$	1,535.39		1,568.17		4,191.27		1,643.82			Order #		
-	20178421	9/10/2017	11.	Office Supplies	Binder	Personal Check	\$ 198	IL	Ş	504.22	Ş	1,688.84		2,712.23		1,306.20		9.21	State		
7	20175919	9/13/2017	MI	Office Supplies	Chargers	PayPal	\$ 78	MI					s	3,117.80		3,615.25			Department		
8	20173206	9/14/2017	IA	Furniture	Chairs	Cash	\$ 430	WI	\$	417.99		1,010.66		5,614.40		331.40		1.98	Item Payment Method		7
9	20179673	9/21/2017	MI		Document Holders	PayPal	\$ 430 \$ 2	Grand Total	\$	2,457.60	ş	4,267.68	\$	15,635.69	ş	6,896.67	\$ 4,09	3.25	Payment Method Total		
10	20177779	9/22/2017	MI	Office Supplies	Binder	Credit Card	\$ 649												More Tables		
11	20171333	9/23/2017	MI	Electronics	Software License	Credit Card	\$ 9														
	20174125	9/26/2017	IL.		Document Holders	Credit Card	\$ 25														
13	20177976	9/26/2017	MI	Office Supplies	Pens	ACH	\$ 72														
14	20171315	9/26/2017	IA	Office Supplies	Document Holders	Cash	\$ 34														
16	20178693	9/28/2017	wi	Office Supplies	Trash Bins	ACH	\$ 101												Drag fields between areas bel	ow:	
17	20174271	10/1/2017	MI	Electronics	Misc Parts	PayPal	\$ 34												T Eiters	III Columns	
18	20175303	10/11/2017	IA	Office Supplies	Paper	Credit Card	\$ 29												Item *	Payment Method	*
19	20179799	10/20/2017	MI	Office Supplies	Post-it	Personal Check	\$ 66														
20	20176400	10/24/2017	11		Document Holders	Credit Card	\$ 802														
20	20178228	10/26/2017	IA	Office Supplies	Paper	Credit Card	\$ 4														
22	20173377	10/27/2017	IL.		Document Holders	Credit Card	\$ 3														
22	20179809	10/29/2017	il.	Office Supplies	Paper	Credit Card	\$ 12												= Rows	Σ Values	
24	20177140	10/30/2017			Document Holders	Credit Card	\$ 73												State ~	Sum of Total	~
25	20178710	11/4/2017		Office Supplies	Post-it	Credit Card	\$ 7														
26	20176561	11/7/2017	MI	Office Supplies	Chargers	Credit Card	\$ 33														
20	20178758	11/8/2017	IA	Electronics	Software License	Credit Card	\$2.088														
1 million (1997)																					

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.

	1															Choose fields to add to rep	ort
Sum of Total	Payment Met	od 💌	Item 👻													Search	
itate 💌	Binder		Cabinets	Chairs		Chargers		Desk	Document Holders	Furniture	Misc Parts	Monitors	Paper		Pens	Order #	
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ι	\$	23.22	\$ 3,069.46	\$	504.22	\$	62.07		\$ 2,221.04	\$ 1,885.29	\$ 281.6	,	\$	361.36		State	
AL .	\$	63.07				\$	38.88		\$ 296.44	\$ 271.78	\$ 57.8	3			\$	☐ Department	
M	s	5.67		\$	417.99	\$	41.89	\$ 1,845.9	\$ 285.22	\$ 525.36	\$ 655.5	\$ 7,438.3	72		s	Payment Method	
Grand Total	\$ 2,	72.43	\$ 3,069.46	\$	2,457.60	\$	151.29	\$ 3,320.8	\$ 3,307.95	\$ 3,234.58	\$ 2,810.9	5 \$ 7,438.3	12 \$	978.55	\$	Total	
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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.

votTa	able1 Si	tive Field: um of Total	Drill Dril Down Up		→ Group Selection 편且 Ungroup 団 Group Field Group	Insert Slicer Filter	ter			Clear Č	Select Move PivotTab Actions		Ids, Items, OLAP Relations k Sets \checkmark Tools \sim Calculations		tChart Reco	ivotTables List Buttons H	Field feaders	
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	20179717	8/25/2017	IL.	Office Supplies	Post-it	Credit Card	\$	8.76	IL.	\$	9,924.68	\$	12,339.49 \$	29,666.06	\$	Order #		
	20178086	9/6/2017	WI	Furniture	Chairs	Personal Check	\$	71.98	м	ş	1,445.18	ş	4,652.39 \$	49,573.49	s	Date Date		
	20178421	9/10/2017	IL.	Office Supplies	Binder	Personal Check	\$	198.61	wi	\$	12,208.36	\$	2 4 2 2 70 6	26 606 46		State		
	20175919	9/13/2017	MI	Office Supplies	Chargers	PayPal	\$	78.18	Grand Total	\$	34,532.21	\$	Insert Slicers	?	×	Department		
	20173206	9/14/2017	IA	Furniture	Chairs	Cash	\$	430.82					Order #			Payment Method		
	20179673	9/21/2017	MI	Office Supplies	Document Holders	PayPal	\$	2.66					Date		_	Total		
	20177779	9/22/2017	MI	Office Supplies	Binder	Credit Card	\$	649.89					State			More Tables		
	20171333	9/23/2017	MI	Electronics	Software License	Credit Card	\$	9.24					Department					
	20174125	9/26/2017	IL.	Office Supplies	Document Holders	Credit Card	\$	25.75					Payment Method			Drag fields between areas l	alaur	
	20177976	9/26/2017	MI	Office Supplies	Pens	ACH	\$	72.86					Total					
	20171315	9/26/2017	IA	Office Supplies	Document Holders	Cash	\$	34.47								T Filters	III Columns	
	20178693	9/28/2017	WI	Office Supplies	Trash Bins	ACH	\$	101.75									Payment Method	
	20174271	10/1/2017	MI	Electronics	Misc Parts	PayPal	\$	34.81										
	20175303	10/11/2017	IA	Office Supplies	Paper	Credit Card	\$	29.65										
	20179799	10/20/2017	MI	Office Supplies	Post-it	Personal Check	\$	66.29								= Rows	Σ Values	
	20176400	10/24/2017	IL.	Office Supplies	Document Holders	Credit Card	\$	802.86								State	Sum of Total	
	20178228	10/26/2017	IA	Office Supplies	Paper	Credit Card	\$	4.98								Suit	Jun of fotal	
	20173377	10/27/2017	IL.	Office Supplies	Document Holders	Credit Card	\$	3.00										
	20179809	10/29/2017	IL.	Office Supplies	Paper	Credit Card	\$	12.80					ОК	Car	cel			

Figure 3: Inserting Slicers

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1	Order #	Date 🖪	State 🔽	Department	item 🗖	Payment Metho	od 🗸 🛛 Total 🗸			nt Method 💌											
2	20175088	7/22/2017		Office Supplies	Paper	Credit Card	\$ 27.08	Sum of I	otal Payme		Cash		Credit Card		PavPal		Personal C	the set	Choose fields to add to repo	t	⊘ ~
4	20177867	8/4/2017	w	Furniture	Chairs	ACH	\$ 417.99	IA	• ACH			13,628.29		,702.92		10,092.74		9,497.85	Search		Q
5	20179717	8/25/2017		Office Supplies	Post-It	Credit Card	\$ 8,76	IL IL	s	9,924.68		12,339.49		9,666.06		6,561.88		8,428.72	Order #		
6	20178086	9/6/2017	w	Furniture	Chairs	Personal Check		MI	s	1,445,18		4.652.39		0.573.49		8,508.63		9.613.03	Date		
7	20178421	9/10/2017	IL.	Office Supplies	Binder	Personal Check		WI	s	12,208.36		3,422.78		5.696.48		3,664.08		1,505.95	State		
8	20175919	9/13/2017	MI	Office Supplies	Chargers	PayPal	\$ 78.18	Crond To		24 522 24		34,042.95		0,638.96		28,827.33		29,045.56	Department Item		
9	20173206	9/14/2017	IA	Furniture	Chairs	Cash	Department	結 張	Item	\$3 5	- K	0 1/0 12.55		,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,	·	201021100	*	25,015150	Payment Method		
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11	20177779	9/22/2017	MI	Office Supplies	Binder	Credit Card	Furniture		Cabine	ets									More Tables		
12	20171333	9/23/2017	MI	Electronics	Software License	Credit Card	Office Supplies		Chairs												
13	20174125	9/26/2017	IL.	Office Supplies	Document Holders	Credit Card			Charge	ers											
14	20177976	9/26/2017	MI	Office Supplies	Pens	ACH			Desk												
15	20171315	9/26/2017	IA	Office Supplies	Document Holders	Cash			Docum	ent Holders									Drag fields between areas b	lows	
16	20178693	9/28/2017	wi	Office Supplies	Trash Bins	ACH			Furnit	ure									T Filters	III Columns	
17	20174271	10/1/2017	MI	Electronics	Misc Parts	PayPal			Misc P	arts									1 Filters	Payment Method	a v
18	20175303	10/11/2017	IA	Office Supplies	Paper	Credit Card														Payment method	<u> </u>
19	20179799	10/20/2017	MI	Office Supplies	Post-it	Personal Check	\$ 66.29														
20	20176400	10/24/2017	IL.	Office Supplies	Document Holders	Credit Card	\$ 802.86														
21	20178228	10/26/2017	IA	Office Supplies	Paper	Credit Card	\$ 4.98														
22	20173377	10/27/2017	IL.	Office Supplies	Document Holders	Credit Card	\$ 3.00												= Rows	Σ Values	
23	20179809	10/29/2017	IL.	Office Supplies	Paper	Credit Card	\$ 12.80												State ~	Sum of Total	~
24	20177140	10/30/2017	IL.	Office Supplies	Document Holders	Credit Card	\$ 73.39														
25	20178710	11/4/2017	IL.	Office Supplies	Post-It	Credit Card	\$ 7.17														
26	20176561	11/7/2017	MI	Office Supplies	Chargers	Credit Card	\$ 33.86														
27	20178758	11/8/2017	IA	Electronics	Software License	Credit Card	\$2,088.42														

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.

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1	Furniture	Chairs	ACH	\$ 417.99	IA	Ś	4,366.81		3,504.30		17,160.76		4,225.40			\$ 31,749.18				Search			
	Office Supplies	Post-it	Credit Card	\$ 8.76	IL.	s	1,046.00		942.90		5,509.64		1,664.33			\$15,127.70				On On	ier #		
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	Office Supplies	Chargers	PayPal	\$ 78.18	Grand Total	\$	13,565.00	5	7,333.03	\$	57,263.77	\$	9,009.29	\$		\$ 99,979.61				De Ite	partment		
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	Office Supplies	Pens	ACH	\$ 72.86				Software	License														
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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 <u>blue box</u>. Meanwhile, the elements in the Item field that does not appear under the item Electronics will show up in the <u>orange box</u>, 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.

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мі	Electronics	Software License	Credit Card	\$ 9.24	Office S				Name: Name:	o use in formulas: Slid	er_item							Report Connections		
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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.

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4 M	Furniture	Chairs	ACH	\$ 417.99	State 💌	ACH Ś	4,366.81		3,504.30		17,160.76		4,225.40			\$ 31,749.18			Search		ρ
S IL	Office Supplies	Post-It	Credit Card	\$ 8.76	IA IL	s s	4,306.81		3,504.30		5.509.64		4,225.40			\$ 31,749.18					
6 MI	Furniture	Chairs	Personal Check	\$ 71.98															Order #		
7 IL	Office Supplies	Binder	Personal Check	\$ 198.61	MI	\$	57.83		2,083.00		28,663.72		2,353.28			\$ 36,656.80			State		
7 IL 8 MI	Office Supplies	Chargers	PayPal	\$ 78.18	WI	\$	8,094.31		802.83		5,929.66		766.29			\$ 16,445.94			Department		8
g IA	Furniture	Chairs	Cash	\$ 430.82	Grand Total		13,565.00	Ş	7,333.03		57,263.77	\$	9,009.29	Ş	12,808.52	\$ 99,979.61			item		
-			PayPal	\$ 430.62 \$ 2.66	Department	t š	- K	Item	ŝ	3 K									Payment Method Total		
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11 MI	Electronics	Software License	Credit Card	\$ 9,24	Furniture			Monitors													
12 MI			Credit Card		Office Sup	plies		Printer													
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14 MI	Office Supplies	Pens	ACH	\$ 72.86						_											_
15 IA			Cash	\$ 34.47															Drag fields between areas belo	wc	
16 MI		Trash Bins	ACH	\$ 101.75															T Filters	III Columns	
17 MI	Electronics	Misc Parts	PayPal	\$ 34.81																Payment Method	÷
18 IA	Office Supplies	Paper	Credit Card	\$ 29.65																	
19 MI	Office Supplies	Post-it	Personal Check	\$ 66.29																	
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23 IL	Office Supplies	Paper	Credit Card	\$ 12.80															State ~	Sum of Total	÷
24 IL	Office Supplies	Document Holders	Credit Card	\$ 73.39																	
25 IL	Office Supplies	Post-It	Credit Card	\$ 7.17																	
26 MI	Office Supplies	Chargers	Credit Card	\$ 33.86																	
27 IA	Electronics	Software License	Credit Card	\$2,088.42																	

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.

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L	Office Supplies	Post-it	Credit Card	\$ 8.76	iL.	s	9,924.68	\$ 12,3	39.49 \$	29,666.06	s	6,561.88	\$ 8,4	28.72 \$ 66,920.	83		Order #		
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И	Office Supplies	Chargers	PayPal	\$ 78.18	Grand Total	\$	34,532.21	\$ 34,0	42.95 \$	140,638.96	\$	28,827.33	\$ 29,0	45.56 \$ 267,087.	00		Item		
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41	Office Supplies	Document Holders	PayPal	\$ 2.66													Total		
И	Office Supplies	Binder	Credit Card	\$ 649.89													More Tables		
41	Electronics	Software License	Credit Card	\$ 9.24															
L		Document Holders	Credit Card	\$ 25.75															
11	Office Supplies	Pens	ACH	\$ 72.86															
4		Document Holders	Cash	\$ 34.47													Drag fields between ar	as below:	
//	Office Supplies	Trash Bins	ACH	\$ 101.75													T Filters	III Column	
1	Electronics	Misc Parts	PayPal	\$ 34.81														Payment N	Aethod
A	Office Supplies	Paper	Credit Card	\$ 29.65															
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-	Office Supplies	Post-it	Credit Card	\$ 73.39															
	Office Supplies	Chargers	Credit Card	\$ 33.86															
11 A	Electronics	Software License	Credit Card	\$ 33.80															

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.

D	E	F	G	Н	I J		к	L		М		N	0)	Ρ	Q	R	R S	R S T	R S T U	R S T U V	R S T U V	R S T U V
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ate y L	Office Supplies	Paper	Credit Card	\$ 27.08	Sum of Tota																		
1	Furniture	Chairs	ACH	\$ 27.08 \$ 417.99		ACH		Cash		lit Card	PayPal		Personal C		Grand Total								
	Office Supplies	Post-it	Credit Card	\$ 8.76	IA	\$	10,953.99		.29 \$	34,702.92		10,092.74			\$ 78,875.80								
	Furniture	Chairs	Personal Check	\$ 71.98	IL.	\$	9,924.68		.49 \$	29,666.06		6,561.88			\$ 66,920.83								
	Furniture Office Supplies	Binder	Personal Check		MI	\$	1,445.18		.39 \$	49,573.49		8,508.63			\$ 73,792.72								
				\$ 198.61	WI	\$	12,208.36		.78 \$	26,696.48		3,664.08			\$ 47,497.65								
	Office Supplies	Chargers	PayPal	\$ 78.18	Grand Total	\$	34,532.21	\$ 34,042	.95 \$	140,638.96	\$	28,827.33	\$	29,045.56	\$ 267,087.00								
	Furniture	Chairs	Cash	\$ 430.82	Date		0		τ.														
		Document Holders	PayPal	\$ 2.66	All Periods			MONTH	÷														
	Office Supplies	Binder	Credit Card	\$ 649.89 \$ 9.24	, 2023				1														
11	Electronics	Software License	Credit Card		JN JUL	AUG	SEP OCT	NOV DEC	_1														
		Document Holders	Credit Card	\$ 25.75																			
	Office Supplies	Pens	ACH	\$ 72.86			13		E,														
		Document Holders	Cash	\$ 34.47																			
	Office Supplies	Trash Bins	ACH	\$ 101.75																			
	Electronics	Misc Parts	PayPal	\$ 34.81																			
4	Office Supplies	Paper	Credit Card	\$ 29.65																			
	Office Supplies	Post-it	Personal Check	\$ 66.29																			
		Document Holders	Credit Card	\$ 802.86																			
	Office Supplies	Paper	Credit Card	\$ 4.98																			
		Document Holders	Credit Card	\$ 3.00																			
L	Office Supplies	Paper	Credit Card	\$ 12.80																			
IL	Office Supplies	Document Holders	Credit Card	\$ 73.39																			
L	Office Supplies	Post-it	Credit Card	\$ 7.17																			
AL .	Office Supplies	Chargers	Credit Card	\$ 33.86																			
IA	Electronics	Software License	Credit Card	\$2,088.42																			
iΔ	Furniture	Furniture	Credit Card	\$ 28.56																			

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.

D	E	F	G	Н	I I	J		К		L	М		N		0	р	Q R	î	PivotTable Fields	~	
1 2 ate -	Department 🗸	ltem 🔽	Payment Method	Tot	tal 🖵	Sum of Total												-			
3 IL	Office Supplies	Paper	Credit Card	\$ 2			ACH	Method 🕑	Cash		Credit Card		PayPal		Personal Check	Grand To			Choose fields to add to report:	-	
4 MI	Furniture	Chairs	ACH	\$ 41		IA	S	472.26				298.73		8.55	Personal Check	\$ 779.5	_		Search		ρ
5 IL	Office Supplies	Post-it	Credit Card	s		IL IL	\$	472.20	s	12.00		278.69	ş	8.33		\$ 290.0			Order #		
6 MI	Furniture	Chairs	Personal Check	\$ 7		MI			s	87.99		82.73			\$ 40.0	51 \$ 211.			Date		2
7 IL	Office Supplies	Binder	Personal Check	\$ 19		WI			\$	07.99		49.81			\$ 40.	\$ 49.1			State		
8 MI	Office Supplies	Chargers	PayPal	\$ 7		Grand Total		472.26		99.99		709.96		8.55	¢	5 49. 51 \$ 1,331.			Department		
9 IA	Furniture	Chairs	Cash	\$ 43		Grand Total	\$	472.20	\$	55.55	, .	709.90	\$	0.33	3 40.	ar à 1,551.	10		Item Payment Method		
10 MI		Document Holders	PayPal		2.66	Date				7									Total		
11 MI	Office Supplies	Binder	Credit Card	\$ 64		Aug - Nov 202	3			MONTHS ~									More Tables		
12 MI	Electronics	Software License	Credit Card	s		2023															
13 IL		Document Holders	Credit Card		5.75	JN JUL	AUG	SEP OC	r NO	/ DEC											
14 MI	Office Supplies	Pens	ACH	\$ 7	2.86	4				Þ											
15 IA	Office Supplies	Document Holders	Cash	\$ 3	4.47														Drag fields between areas below		
16 MI	Office Supplies	Trash Bins	ACH	\$ 10	1.75																
17 MI	Electronics	Misc Parts	PayPal	\$ 3	4.81														T Filters	III Columns	
18 IA	Office Supplies	Paper	Credit Card	\$ 2	9.65															Payment Method	<u> </u>
19 MI	Office Supplies	Post-it	Personal Check	\$ 6	i6.29																
20 IL	Office Supplies	Document Holders	Credit Card	\$ 80	12.86																
21 IA	Office Supplies	Paper	Credit Card	\$	4.98																
22 IL	Office Supplies	Document Holders	Credit Card	\$	3.00														E Rows	Σ Values	
23 IL	Office Supplies	Paper	Credit Card	\$ 1	2.80														State ~		ų.
24 IL	Office Supplies	Document Holders	Credit Card	\$ 7	3.39																
25 IL	Office Supplies	Post-it	Credit Card	\$	7.17																
26 MI	Office Supplies	Chargers	Credit Card	\$ 3	13.86																
27 IA	Electronics	Software License	Credit Card	\$2,08	18.42																

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.

D	E	F	G	H I	J	К	L	М		N		0		P	Q			R	PivotTable Fields	~ 3
2 ate v	Department 🗸	ltem 🔽	Payment Method	🗸 🛛 Total 🗸	Sum of Tot	al					Payme	nt Method 💌							Choose fields to add to report	
3 IL	Office Supplies	Paper	Credit Card	\$ 27.08	State	• Years (Da •	Quarters (Date)	 Months (Date) 		- Date -	ACH		Cash		Credit Card		PayPal		Choose news to add to report	
4 MI	Furniture	Chairs	ACH	\$ 417.99	BIA	2017			_		s	270.16	s	465.28	\$ 2	,151.61	s	3	Search	3
5 IL	Office Supplies	Post-it	Credit Card	\$ 8.76		2018	Insert Slicers	7	×		s	1.566.26	s	2.078.64	s s	.372.89	s	2,1	Order #	
6 M	Furniture	Chairs	Personal Check	\$ 71.98		2019					s	776.79	s	2.906.06	s a	.231.91	s	2	Date	
7 IL	Office Supplies	Binder	Personal Check	\$ 198.61		± 2020	Order#				s	1,447.07		2,836.37		,993.93			State	
s MI	Office Supplies	Chargers	PayPal	\$ 78.18		± 2021	Date Date				s	1,011.06		2,112.03		,679.97		1.7	Department Item	
9 IA	Furniture	Chairs	Cash	\$ 430.82		± 2022	Departm	-			s	3,409.30		1,747.70		,078.04		1,0	Payment Method	
10 MI	Office Supplies	Document Holders	PayPal	\$ 2.66		3 2023	litem	inc.			s	2,473.36		1,482,20		194.57		4,0	Total	
11 MI	Office Supplies	Binder	Credit Card	\$ 649.89	IA Total	10 2023	Payment	Method			s	10.953.99		13.628.29		.702.92		10.0	Months (Date)	
12 MI	Electronics	Software License	Credit Card	\$ 9.24		2017	Total		_		ŝ	66.87		58.11		.474.63	>	10,0	Quarters (Date)	
13 IL		Document Holders	Credit Card	\$ 25.75	UIL.	E 2017	Months (Ouarters				ŝ	2,209.52		1,587.45		,474.05	•		Years (Date)	
13 NL	Office Supplies	Pens	ACH	\$ 72.86		E 2018	Years IDa												wore rables	
		Document Holders	Cash	\$ 34.47							\$	163.49		1,150.81		,004.21		1		
15 IA		Trash Bins	ACH	\$ 101.75		2020					\$	1,535.65		1,338.41		,536.29		2,1	Drag fields between areas bel	ow:
16 MI	Office Supplies					2021					\$	2,403.12		7,538.99		,867.91		2	T Filters	III Columns
17 MI	Electronics	Misc Parts	PayPal	\$ 34.81		2022					\$	1,904.87		424.58		,573.50		1,8		Payment Method ~
18 IA	Office Supplies	Paper	Credit Card	\$ 29.65		2023				_	\$	1,641.16		241.13		,871.31		2,2		
19 MI	Office Supplies	Post-it	Personal Check	\$ 66.29	IL Total						\$	9,924.68	\$	12,339.49	\$ 29	,666.06	\$	6,5		
20 IL		Document Holders	Credit Card	\$ 802.86	⊟мі	2017		OK Can	cel		\$	114.80	\$	201.00	\$	710.32	\$	1		
21 IA	Office Supplies	Paper	Credit Card	\$ 4.98		2018					\$	503.69	\$	468.37	\$ 13	,594.12	\$	3		
22 IL	Office Supplies	Document Holders	Credit Card	\$ 3.00		2019					\$	210.33	\$	1,256.21	\$ 5	,135.33	\$	1,8	= Rows	Σ Values
23 IL	Office Supplies	Paper	Credit Card	\$ 12.80		2020					\$	6.73	\$	1,311.88	\$ 10	,836.25	\$	1,1	State ~	Sum of Total ~
24 IL	Office Supplies	Document Holders	Credit Card	\$ 73.39		2021					s	234.73	s	324.98	\$ 8	,218.32	s	2,7	Years (Date) ~	
25 IL	Office Supplies	Post-it	Credit Card	\$ 7.17		2022					s	331.81	s	750.38	\$ 5	,784.00	\$	2,1	Quarters (Date) ~	
26 MI	Office Supplies	Chargers	Credit Card	\$ 33.86		2023					\$	43.10	\$	339.56	\$ 1	,295.16	\$	1	Months (Date)	
27 IA	Electronics	Software License	Credit Card	\$2,088.42	MI Total						\$	1,445.18	\$	4,652.39	\$ 49	,573.49	\$	8,5	Date v	

Figure 11: Timeline: Adding Dates to Pivot Tables

Ŧ	Department 🗸 Item 🗸	Payment Method	🗸 🛛 Total 🗸	Sum of Tota					Payment	t Method 💌						
	Office Sup Years (Date) 👘 🔅 🎙	Months (Date)	絙 📡	State	Years (Da	T Quarters (Date)	 Months (Date) 	.T Date 🔻	Cash		Credit Card		Personal Check	Grand Total		
	Furnitu 2018	lut		⊟IA	± 2023						\$	290.93		\$ 290.93		
	Office Sup 2019	Aug		IA Total							\$	290.93		\$ 290.93		
	Furnitu 2020	Sep		Ξĸ	± 2023						\$	278.69		\$ 278.69		
	Office Sup	Oct		IL Total							\$	278.69		\$ 278.69		
	Office Sup	Nov		⊟мі	± 2023				\$	87.99			\$ 36.74	\$ 124.73		
	Furnitu 2023	Dec		MI Total					\$	87.99			\$ 36.74	\$ 124.73		
	Office Sup <7/22/2017	<7/22/2017		⊟wi	± 2023						\$	49.81		\$ 49.81		
	Office Sup	>10/4/2023	I [WI Total							\$	49.81		\$ 49.81		
	Electron	1014/2023		Grand Total					\$	87.99	\$	619.43	\$ 36.74	\$ 744.16		
	Office Supplies Document Holders	Credit Card	\$ 25.75													
	Office Supplies Pens	ACH	\$ 72.86													
	Office Supplies Document Holders	Cash	\$ 34.47													
	Office Supplies Trash Bins	ACH	\$ 101.75													
	Electronics Misc Parts	PayPal	\$ 34.81													
	Office Supplies Paper	Credit Card	\$ 29.65													
	Office Supplies Post-It	Personal Check	\$ 66.29													
	Office Supplies Document Holders	Credit Card	\$ 802.86													
	Office Supplies Paper	Credit Card	\$ 4.98													
	Office Supplies Document Holders	Credit Card	\$ 3.00													
	Office Supplies Paper	Credit Card	\$ 12.80													
	Office Supplies Document Holders	Credit Card	\$ 73.39													
	Office Supplies Post-it	Credit Card	\$ 7.17													
	Office Supplies Chargers	Credit Card	\$ 33.86													
	Electronics Software License	Credit Card	\$2,088.42													
	Furniture Furniture	Credit Card	\$ 28.56													

Figure 12: Date Filters using Slicers

Then, select date based filters as shown in Figure 12. Then, we can create the PivotTable of statepayment 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.

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-	IA	ş			\$ 34,702.92 \$ 29.666.06			\$ 78,875.80						- I												
7	MI	ş			\$ 49,573,49			\$ 66,920.83 \$ 73,792,72	Furnit	ture		Cabir	iets		2	018										
	WI	\$			\$ 26.696.48			\$ 47,497.65	Office	Supplies		Chair	s		2	019										
	Grand Total	¢			\$ 140,638,96			\$ 267.087.00				Chare														
0	Grand Total	ľ	34,332.22	\$ 54,042.55	\$ 140,030.50	\$ 20,027.55	\$ 23,043.30	\$ 201,001.00		K Cut			ters			020										
1	Sum of Total	Colun	nn Labels 🔻												2	021										
2	Row Labels	ACH		Cash	Credit Card	PayPal	Personal Check	Grand Total	1 L	🖹 Сору			ent Ho	ders		022										
3	Binder	\$	2,772.43	\$ 3,224.82	\$ 10,085.73	\$ 5,322.46	\$ 2,573.38	\$ 23,978.82		Paste Op	ntions															
1	Cabinets	\$	3,069.46	\$ 2,707.97	\$ 10,248.14	\$ 425.11		\$ 16,592.64					re		2	023		' <u> </u>								
5	Chairs	\$			\$ 15,635.69			\$ 33,350.89		ĉ			arts			7/22/2017										
5	Chargers	\$			\$ 1,953.33			\$ 4,523.05	<u>6</u> r	Refresh																
	Desk	\$			\$ 15,299.59			\$ 28,173.27																		
	Document Ho	li Ş			\$ 14,186.56			\$ 25,556.20	ź	Sort A to	Z		Repo	t Connections (Departe	ment)	?	×								
	Furniture	ş			\$ 5,696.26			\$ 11,859.66	z	⊥ Sort Z to	۵		Colum	Di settete en e	ni	hart reports to c										
	Misc Parts Monitors	ş			\$ 10,628.97 \$ 15,505.60			\$ 22,516.64 \$ 32,073.08		-			Selec	Name	PROIC	Shee		is niter								
	Paper	ş			\$ 3,190.19			\$ 7,109.88		Clear Filt	er from "Depa	artment"														
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7	Trash Bins	\$	288.35	\$ 578.74	\$ 1,063.32	\$ 24.96	\$ 316.29	\$ 2,271.64		-	equinan															
	Grand Total	\$	34,532.21	\$ 34,042.95	\$ 140,638.96	\$ 28,827.33	\$ 29,045.56	\$ 267,087.00	1	Group																
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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.

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4	2017/307	8/25/2017	IL.	Office Supplies	Post-it	Credit Card	\$ 8.76																	
5	20175717	9/6/2017	WI	Furniture	Chairs	Personal Check	\$ 71.98																	
7	20178421	9/10/2017		Office Supplies	Binder	Personal Check	\$ 198.61																	
8	20175919	9/13/2017	MI	Office Supplies	Chargers	PayPal	\$ 78.18																	
9	20173206	9/14/2017	IA	Furniture	Chairs	Cash	\$ 430.82																	
10	20179673	9/21/2017	MI	Office Supplies	Document Holders	PayPal	\$ 2.66																	
11	20177779	9/22/2017	MI	Office Supplies	Binder	Credit Card	\$ 649.89																	
12	20171333	9/23/2017	MI	Electronics	Software License	Credit Card	\$ 9.24																	
13	20174125	9/26/2017	IL.	Office Supplies	Document Holders	Credit Card	\$ 25.75																	
14	20177976	9/26/2017	MI	Office Supplies	Pens	ACH	\$ 72.86																	
15	20171315	9/26/2017	IA	Office Supplies	Document Holders	Cash	\$ 34.47																	
16	20178693	9/28/2017	WI	Office Supplies	Trash Bins	ACH	\$ 101.75																	
17	20174271	10/1/2017	MI	Electronics	Misc Parts	PayPal	\$ 34.81																	
18	20175303	10/11/2017	IA	Office Supplies	Paper	Credit Card	\$ 29.65																	
19	20179799	10/20/2017		Office Supplies	Post-It	Personal Check	\$ 66.29																	
20	20176400	10/24/2017			Document Holders	Credit Card	\$ 802.86																	
21	20178228	10/26/2017		Office Supplies	Paper	Credit Card	\$ 4.98																	
22	20173377	10/27/2017			Document Holders	Credit Card	\$ 3.00																	
23	20179809	10/29/2017		Office Supplies	Paper	Credit Card	\$ 12.80																	
24	20177140	10/30/2017			Document Holders	Credit Card	\$ 73.39																	
25	20178710	11/4/2017	IL	Office Supplies	Post-it	Credit Card	\$ 7.17																	
26	20176561	11/7/2017	MI	Office Supplies	Chargers	Credit Card	\$ 33.86																	
27	20178758	11/8/2017	IA	Electronics	Software License	Credit Card	\$2,088.42																	

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.

1 A	В	С	D	E	F	G	н	1 1	К	L	M N	D P	Q R	PivotTable Fields	~ ×
2	Order # 🗸	Date _1	State 🗸	Department 🗸	ltem 🖵	Payment Method	Total	Sum of Total	Column Labels 👻					Choose fields to add to report	
3	20175088	7/22/2017	IL.	Office Supplies	Paper	Credit Card	\$ 27.08	-	 Electronics 		Office Supplies Grand Total			Choose fields to add to report	
4	20177867	8/4/2017	wi	Furniture	Chairs	ACH	\$ 417.95	ACH	13565.00031	12082.50864	8884.700617 34532.20956			Search	Q
5	20179717	8/25/2017	IL.	Office Supplies	Post-it	Credit Card	\$ 8.76	Cash	7333.030516	11971.89991	14738.01475 34042.94518			Order #	
6	20178086	9/6/2017	WI	Furniture	Chairs	Personal Check	\$ 71.98	Credit Card	57263.77357	46668.94677	36706.23904 140638.9594			Date	
7	20178421	9/10/2017	IL.	Office Supplies	Binder	Personal Check	\$ 198.61	PayPal	9009.289721	10210.9355	9607.10115 28827.32637			State	
8	20175919	9/13/2017	MI	Office Supplies	Chargers	PayPal	\$ 78.18	Personal Che	ck 12808.51767	8623.987295	7613.051377 29045.55634			Department Item	
9	20173206	9/14/2017	IA	Furniture	Chairs	Cash	\$ 430.82	Grand Total	99979.61179	89558.27811	77549.10694 267086.9968			Payment Method	
10	20179673	9/21/2017	MI	Office Supplies	Document Holders	PayPal	\$ 2.66				~			Total	
11	20177779	9/22/2017	MI	Office Supplies	Binder	Credit Card	\$ 649.89	Sum of Total				,	· 🛨		
12	20171333	9/23/2017	MI	Electronics	Software License	Credit Card	\$ 9.24	70000							
13	20174125	9/26/2017	IL.	Office Supplies	Document Holders	Credit Card	\$ 25.75	60000					<u>a</u>		
14	20177976	9/26/2017	MI	Office Supplies	Pens	ACH	\$ 72.86	50000		_		Department *			
15	20171315	9/26/2017	IA	Office Supplies	Document Holders	Cash	\$ 34.47	40000			-	Electronics		Drag fields between areas bel	ow:
16	20178693	9/28/2017	wi	Office Supplies	Trash Bins	ACH	\$ 101.75	Q30000				= Furniture	1	T Filters	III Legend (Series)
17	20174271	10/1/2017	MI	Electronics	Misc Parts	PayPal	\$ 34.81	20000				■ Office Supplies		1 Fillers	Department ~
18	20175303	10/11/2017	IA	Office Supplies	Paper	Credit Card	\$ 29.65	10000							Department
19	20179799	10/20/2017	MI	Office Supplies	Post-it	Personal Check	\$ 66.29	0	ACH Cash	Credit C	ard PayPal Personal Check				
20	20176400	10/24/2017	IL.	Office Supplies	Document Holders	Credit Card	\$ 802.86	PaymentMet		Uredit C	ard PayPai Personal Check				
21	20178228	10/26/2017	IA	Office Supplies	Paper	Credit Card	\$ 4.98	O			-0	c	1		
22	20173377	10/27/2017	IL.	Office Supplies	Document Holders	Credit Card	\$ 3.00							Axis (Categories)	Σ Values
23	20179809	10/29/2017	IL.	Office Supplies	Paper	Credit Card	\$ 12.80							Payment Method ~	Sum of Total ~
24	20177140	10/30/2017	IL.	Office Supplies	Document Holders	Credit Card	\$ 73.35								
25	20178710	11/4/2017	IL.	Office Supplies	Post-it	Credit Card	\$ 7.17								
26	20176561	11/7/2017	MI	Office Supplies	Chargers	Credit Card	\$ 33.86								
27	20178758	11/8/2017	IA	Electronics	Software License	Credit Card	\$2,088.42								

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.

A	В	с	D	E	F	G	н	1 1	К	L	м	N	O P	Q	R	S	T U	٧	
	Order # 🗸	Date 🔐	State 🗸	Department 🗸	ltem 🗸	Payment Method	Total	Sum of Total C	Column Labels 💌				⊖ Years (Date) ੱ	E 🐨 🛙					
	20175088	7/22/2017	IL.	Office Supplies	Paper	Credit Card	\$ 27.08	Row Labels V		Furniture	Office Supplies	Grand Total	2017						
	20177867	8/4/2017	WI	Furniture	Chairs	ACH	\$ 417.99	ACH		4630,787086		10030.27061	2018	-11					
	20179717	8/25/2017	IL.	Office Supplies	Post-it	Credit Card	\$ 8.76	Cash	961.5434846			5077.643997	2019	- 11					
	20178086	9/6/2017	wi	Furniture	Chairs	Personal Check	\$ 71.98	Credit Card		16024.56815		37170.56392	2020	ΞĻ					
	20178421	9/10/2017	IL.	Office Supplies	Binder	Personal Check	\$ 198.61	PayPal		2117.002417		11934.86859	2021	= 1 ï					
	20175919	9/13/2017	MI	Office Supplies	Chargers	PayPal	\$ 78.18	Personal Check	375.6685836			2685.071417	2022	- 11					
	20173206	9/14/2017	IA	Furniture	Chairs	Cash	\$ 430.82	Grand Total	23820.21245			66898.41852	2022	- 11					
	20179673	9/21/2017	MI	Office Supplies	Document Holders	PayPal	\$ 2.66						<7/22/2017						
	20177779	9/22/2017	MI	Office Supplies	Binder	Credit Card	\$ 649.85	Sum of Total					0						
	20171333	9/23/2017	MI	Electronics	Software License	Credit Card	\$ 9.24	18000											
	20174125	9/26/2017	IL.	Office Supplies	Document Holders	Credit Card	\$ 25.75	16000											
	20177976	9/26/2017	MI	Office Supplies	Pens	ACH	\$ 72.86	14000											
	20171315	9/26/2017	IA	Office Supplies	Document Holders	Cash	\$ 34.47	10000					Department • Electronics						
	20178693	9/28/2017	w	Office Supplies	Trash Bins	ACH	\$ 101.75	8000			_		Furniture						
	20174271	10/1/2017	MI	Electronics	Misc Parts	PayPal	\$ 34.81	6000					II Office Supplies						
	20175303	10/11/2017	IA	Office Supplies	Paper	Credit Card	\$ 29.65	2000											
	20179799	10/20/2017	MI	Office Supplies	Post-it	Personal Check	\$ 66.29	0											
	20176400	10/24/2017	IL.	Office Supplies	Document Holders	Credit Card	\$ 802.86	Payment Method +		Credit Ca	ird PayPal	Personal Ch	eck						
	20178228	10/26/2017	IA	Office Supplies	Paper	Credit Card	\$ 4.98	Paymencheoroo *											
	20173377	10/27/2017	IL.	Office Supplies	Document Holders	Credit Card	\$ 3.00												
	20179809	10/29/2017	IL.	Office Supplies	Paper	Credit Card	\$ 12.80												
	20177140	10/30/2017	IL.	Office Supplies	Document Holders	Credit Card	\$ 73.35												
	20178710	11/4/2017	IL.	Office Supplies	Post-it	Credit Card	\$ 7.17												
	20176561	11/7/2017	MI	Office Supplies	Chargers	Credit Card	\$ 33.86												
	20178758	11/8/2017	IA	Electronics	Software License	Credit Card	\$2,088.42												
	20171100	11/10/2017	1.6	Eurolturo	Euroituro	Crodit Cord	é 70 54												

Figure 16: Slicers in PivotCharts