

Pivot Tables, Part 2

IN THE LAST INSTALLMENT OF “WORK SMARTER—NOT HARDER,” I discussed pivot tables in Excel with a promise of practical application examples in this installment. Again, my thanks to Barbara Job Packham, a compliance specialist from the Banker’s Bank in Madison, Wis., for her contributions to this article.

Before we cover examples, let’s consider why you might want to use pivot tables in the first place, especially for Home Mortgage Disclosure Act (HMDA) analysis (although the tables’ usefulness is not limited to this):

- First and foremost, pivot tables offer a fast, easy way to get information from the data you have collected—data mining of a sort.

- It may well be that your examiner will use these same techniques because they are fast and efficient, revealing trends in the data and allowing data to be checked or validated for errors. I have always felt that it was a sound practice to follow the workpapers and procedures of your examiners. This allows you to better understand what they’re looking for and to anticipate the questions they’ll ask. When they want to compare demographics of your applications, loans, and actual market area, you need to know first what the answers will be. Neither you nor your management wants surprises.

- A picture is worth a thousand words, and you can create many types of graphs directly from pivot table results. This often provides an immediate understanding of the overall results, with the numerical data available for closer detail.

- Validating your data becomes almost effortless. There are many pro-

grams available to assist you in your HMDA Loan Application Register (LAR) filing. They validate entries and look for codes that are not compatible. These programs generally do many things that pivot tables will not, but they also come at a price. If you are not using an expensive program to its full potential—that is, using it only for validation and filing—pivot tables may be an inexpensive way to save those budget dollars for other things. Likewise, if you have very limited tools and currently validate your data manually, this is a sound way to check your data before sending it to the regulators. Validating your data with pivot tables is helpful for two reasons:

- Obvious mistakes jump out at you. Example: I can compare coborrower race to coborrower sex and come up with 8/5. Then the pivot table tells me exactly which file needs correcting, too.
- I can manipulate the data for emphasis. Example: How many purchases were in a particular county?

It is assumed that the reader is familiar with LAR entry codes or has a worksheet available providing these. (There are also several available in the tools section of Bankersonline.com/hmda_page if needed). I am using a sample LAR with 10 records in it for these examples. I have randomly entered data and created some errors such as entering “23” in an occupancy

field that should contain a 1, 2, or 3. Also, there are some entries for a coapplicant such as under “sex,” but incompatible entries are on that same record, such as under “ethnicity.” One field says a coapplicant exists and the other says it doesn’t. These are the common errors that get submitted when inadequate validation is done on your submission file.

In this quick tutorial I am using Excel 2002, SP3. Starting with Excel 2003 you may have up to 32,500 unique items in each record in your spreadsheet; prior to this version you had a limit of 8,000 unique items per record. Either of these gives you plenty of additional data capability to add to your LAR, such as the lender, the branch originating the loan, product types, special incentives you want to track. It is this type of additional tracking that adds value to the compliance function and helps your marketing area, management, and the bank itself at little cost. While HMDA is in this example, these could also be records of deposit products you have extracted from your system. With strong data analysis techniques, compliance can be more of a resource than a cost center. But just as you scrub your LAR prior to submission, you must scrub this spreadsheet before creating pivot tables reports. The pivot table itself can help the scrubbing process.

- Your spreadsheet must have column headings in the first row of data to

identify the column contents—"Application or Loan No.," "Date Received," "Loan Type," etc.

■ A tabular layout works best. Fortunately, these are common to the LAR formats created in Excel. The headings, such as offered immediately above, span your spreadsheet in cells A1, B1, C1, etc., and the data for each loan request follows under them sequentially on rows 2, 3, 4, etc. Each title must be in its own cell.

■ Each column title must be unique. This means the "Received_Date" will be clearly different from the "Action_Date." You can't split these titles in different cells. If "Action" was over "Date" and "Received" was over "Date" the pivot table could get confused over two columns with the same header cell of "Date."

■ Blank cells should be avoided, as these may show as errors. If the value is not known, add a temporary value as a placeholder such as a zero or "xxx."

■ Ensure that the fields are properly formatted. You may have numerals and text, but your numeric fields must allow for calculations with a number format, currency, decimal, etc. My experience in sending spreadsheet templates to branches where they completed their own LARs often revealed that they were returned with different formatting and numeric-text errors. You may find it helpful to lock and secure the cells where possible if you have others entering data.

Where I refer to pull-down menus and selected items, I am using the greater-than symbol ">" to depict each step.

With your LAR file open in Excel, select Data > Pivot Table and Pivot Chart Report. Accept the defaults selected by the radio buttons "Microsoft Excel list or database" and "PivotTable." Click next. The PivotTable wizard will automatically select the entire data

area beginning with the header row, as shown in this example:



Select the "New Worksheet" default and then finish. The pivot table area has three sections we'll use here: at the top there is the "Column Fields" space, below that to the far left is the "Drop Row Fields" space, and to the right is the "Drop Data Items" space.

In my first example I will look at coapplicant information. Here is the sample table that contains several errors. Notably, application 8 has a code of 21 entered for the ethnicity of the coapplicant. Only codes of 1-5 are allowable here.

	A	O	P	Q	R	S	T
1	App/Loan No	Eth A	Eth CA	R A	R CA	Six A	Six CA
2	1	1	1	1	8	1	2
3	2	2	2	2	8	2	1
4	3	3	2	3	8	1	1
5	4	4	1	4	1	2	1
6	5	5	1	5	2	1	2
7	6	1	2	1	3	2	1
8	7	2	2	2	4	1	2
9	8	3	21	3	5	2	1
10	9	1	2	4	1	1	2
11	10	2	1	5	2	2	1

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Making sure you're on the pivot table tab, drag and drop the "Eth_CA" to the left hand area which says "Drop Row Fields Here." When I do this, I automatically see the unique fields that are in my data. Because I know this should have only a 1 to a 5, it is obvious the 21 is an error.

	A	B
1		
2		
3		
4	Eth CA	
5		1
6		2
7		21
8	Grand Total	
9		

When I double-click on the 21 itself, Excel opens a new window titled "Show Detail." I double-click on "App/Loan_No." and see that it identifies number 8 as my problem.

It is important to note that I can now click on the worksheet tab "Sample Data" and change application 8's information to the correct number. That will not change my pivot table, which works off pivot cache (stored information from the source). So I now have to manually tell it to update the pivot table. I can do this by clicking on the red exclamation

	A	B
1		
2		
3		
4	Eth CA	App/Loan No
5		1
6		2
7		21
8	21 Total	
9	Grand Total	
10		

tion mark in the pivot table toolbar. If I hover my mouse over it, it is labeled “Refresh Data” and my application 8 is immediately gone. Now I see only 1s and 2s, which is correct.

Now let’s verify the sex of coapplicants against the race of coapplicants. Starting with a fresh pivot table form (remember, you can drag any fields there out of the pivot table area to delete them, you need not close and reopen the sheet) I’ll drag “R_CA” to the drop row fields space, “Sx_CA” to the drop column fields space and “LoanAmt” to the drop data items. I don’t really want the loan amounts, so I’ll double-click the cell with “Sum of LoanAmt” and change that to count. I know that the race code for loans with no coapplicants is 8. The code under sex for no coapplicants is 5. These two codes can co-exist but others must be reviewed. I can see in the table immediately that under the sex of the coapplicant field there are problems. Sex code 1 (male) has two loans and code 2 (female) has one. In my example, when the race of a coapplicant is 8—meaning there isn’t a coapplicant—then the code for his or her sex should be 5, i.e., no coapplicant. I double-click on the “R_CA” code 8, select “App/Loan_No,” and see that it identifies application numbers 1, 2, and 3 as those on my suspect list. Now I can reconcile the files’ correct data against the LAR and make the changes as necessary.

R_CA	Sx_CA	Count of LoanAmt	Grand Total
1	1	2	2
2	2	1	1
3	3	1	1
4	4	1	1
5	5	1	1
6	6	1	1
7	7	1	1
8	8	1	1
9	9	1	1
10	10	1	1
11	11	1	1
12	12	1	1
13	13	1	1
14	14	1	1
15	15	1	1
16	16	1	1
17	17	1	1
18	18	1	1
19	19	1	1
20	20	1	1
21	21	1	1
22	22	1	1
23	23	1	1
24	24	1	1
25	25	1	1
26	26	1	1
27	27	1	1
28	28	1	1
29	29	1	1
30	30	1	1
31	31	1	1
32	32	1	1
33	33	1	1
34	34	1	1
35	35	1	1
36	36	1	1
37	37	1	1
38	38	1	1
39	39	1	1
40	40	1	1
41	41	1	1
42	42	1	1
43	43	1	1
44	44	1	1
45	45	1	1
46	46	1	1
47	47	1	1
48	48	1	1
49	49	1	1
50	50	1	1
51	51	1	1
52	52	1	1
53	53	1	1
54	54	1	1
55	55	1	1
56	56	1	1
57	57	1	1
58	58	1	1
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61	61	1	1
62	62	1	1
63	63	1	1
64	64	1	1
65	65	1	1
66	66	1	1
67	67	1	1
68	68	1	1
69	69	1	1
70	70	1	1
71	71	1	1
72	72	1	1
73	73	1	1
74	74	1	1
75	75	1	1
76	76	1	1
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88	88	1	1
89	89	1	1
90	90	1	1
91	91	1	1
92	92	1	1
93	93	1	1
94	94	1	1
95	95	1	1
96	96	1	1
97	97	1	1
98	98	1	1
99	99	1	1
100	100	1	1

Now I want to look at some loan counts, to see the number of loans by ethnicity of applicant. I first want to clear the fields I have so I can click and drag them out of the pivot table

area. I’ll do this to “App/Loan_No” and it is removed. I do the same with all other fields and replace them with the “Eth_A.” I now have 1 through 5 listed because each of these is represented in my LAR data. Then I click on “LoanAmt” in my list of fields available and drag and drop it into the “Drop Data Items Here” area in the center of the pivot table area. While this provides me with a table of loan totals by ethnicity of applicant, I want the count. I double-click on the header “Sum of LoanAmt,” which is above “Eth_A,” and a new pop-up window appears, allowing me to select a different mathematical function. I’ll select “Count” and click OK, and then the pivot table is updated, allowing me to see the count by ethnicity code. I also have a grand total at the bottom so I know it is correct.

Eth_A	Sx_CA	Count of LoanAmt	Total
1	1	3	3
2	2	3	3
3	3	2	2
4	4	1	1
5	5	1	1
Grand Total		10	10

In this quick tutorial we have examined how to validate some of our LAR entries and we have seen how to begin extracting demographic data for comparison.

The data table reports can easily be copied and pasted on another spreadsheet or another area of this one for more convenient formatting and use. I suggest selecting the cells desired, selecting Edit > Copy, selecting the area you want the data to be in, and selecting Edit > Paste Special > Values and Number Formats.

By adding additional columns to your LAR data, you could track each loan by branch, lender, product type or any other code you want output on. This additional data could provide loan production numbers for each of these fields. You could compare approval/denial rates by lender, branch, product, etc., to see what products are accepted and where. This analysis can be done on any frequency you want. It may be used to scrub your annual HMDA submission, or you may look

at loan production in LMI areas on a quarterly basis and tweak marketing efforts in those areas as needed. You can examine where home improvement loans are generated, what loans are HOEPA-applicable, or anything else. The possibilities are endless; you can get out of pivot tables whatever you put into them. And because you are dragging and dropping data fields, your actual data is untouched. You can add, subtract, and rearrange data fields for different reports. You can also graph these reports as you see fit, such as to add to your CRA/HMDA/Fair Lending reports. BC

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Mr. Zavoina, who has been in finance and banking for 23 years, was the 2003 recipient of the American Bankers Association’s Distinguished Service Award for his involvement and accomplishments in the field of regulatory compliance management. He is a past chairman of the ABA Compliance Executive Committee and served on the ABA Bank Compliance Editorial Advisory Board, and currently serves Compliance Action magazine, and the ABA Compliance School Board. He also served on the Texas Bankers Association’s Compliance Committee. He is a graduate of the ABA National Commercial Lending School, National Compliance and National Graduate Compliance Schools, and is a Certified Regulatory Compliance Manager with the Institute of Certified Bankers. You can reach Andy on the Internet by using his e-mail address, andyz@bankersonline.com, or visiting his personal Web site at <http://home.hot.rr.com/zavoina/home.html>.