

Homework Problem #2 Credit Scoring Model

APEC 4501

Spring 2009

Objective: To give you practice designing and implementing a credit scoring model and applying it to financial data using Excel.

Excel features used: Vlookup, Match and Index functions, Logical (If) functions, Combo boxes

Reading: Look at the credit scorecard examples on the class web page. Look at the handout on Vlookup, Match, Index, and logical If functions.

Assignment:

1. Prepare a farm financial data set for use in this credit scoring model application. This will be one of three spreadsheets in your Excel workbook. Name this **DATA**.

To do this, go to the Center for Farm Financial Management (CFFM) web page and the FINBIN Farm Financial Database (www.finbin.umn.edu), select the Whole Farm Summary Reports and select the Financial Standards Measures report. Set the summary report criterion and run the FINBIN program.. Generate the summary report for farms in Minnesota according to groups of net farm income, e.g., low 20% farms, 40-60% farms, and high 20% farms. You can use from 3-5 groups (think of each group as an individual farm client.) You can do this in one run of FINBIN by setting the “column headings” to be net farm income. You are free to select crop farms, dairy farms, hog farms, or all farms, based on your interest. It is also a good idea to use more than one year in your data set, since the purpose of credit analysis is to determine the long-term creditworthiness of the borrower. Farm lenders usually try to get 3 recent years of records from their clients. Copy the FINBIN data into your Excel spreadsheet and format the data by adjusting the column widths in Excel to produce a table similar to the one on the next page.

2. In the **DATA** spreadsheet develop a second table that displays your credit score model “structure.” It should include the ratios and the corresponding credit ratings that correspond with the ratio value ranges that denote “credit quality” differences. Develop a weighting scheme for the range of weighted points you will use and the corresponding rating for each. For example, the Vermont scorecard uses equal weights (=1) for each of the financial measures and all of the measures are included in the scoring calculation. The rating scheme that you develop must be consistent with the number of financial measures (ratios) and the total point scheme that you select.
3. Next, develop credit scoring models that are capable of using the **DATA** spreadsheet information to perform an analysis for each of the net farm income groups. You will develop two such models in this assignment. The first model should make extensive use of If statements to retrieve the credit ratings and the weights for each of the ratios. The second model should make extensive use of *Vlookup, Match and Index* functions where needed to retrieve the credit ratings associated with the ratio values and the weights for each of the ratios. These two spreadsheets will be the output of your credit scoring model applications. Name these two spreadsheets as **MODEL1** and **MODEL2**.

(over)

4. Prepare a discussion of your spreadsheet design. In your discussion include the following items:
- a) your selection of the financial measures included in the models from those found in the DATA spreadsheet,
 - b) your selection of the gradations of credit quality reported in the DATA spreadsheet,
 - c) your selection of the weighting scheme for the financial measures reported in the MODEL spreadsheets, and
 - d) a brief interpretation of your model results.

Example Data:

Minnesota Crop Farms by Net Farm Income Group, 2002

	Low 20%	40 - 60%	High 20%
Current ratio	1	1.27	1.77
Farm debt to asset ratio	57%	58%	47%
Farm equity to asset ratio	43%	42%	53%
Farm debt to equity ratio	134%	137%	87%
Rate of return on farm assets	-2.80%	7.50%	12.50%
Rate of return on farm equity	-21.50%	9.40%	17.80%
Operating profit margin	-6.80%	14.50%	24.70%
Term debt coverage ratio	44%	153%	238%
Asset turnover rate (cost)	41.30%	51.80%	50.50%
Operating expense ratio	87.60%	71.70%	64.60%
Depreciation expense ratio	8.90%	5.80%	4.20%
Interest expense ratio	10.50%	7.50%	4.90%
Net farm income ratio	-7.10%	15.00%	26.30%