BY PROF. LYNN M. LOPUCKI

The Bankruptcy Success Modeling Project: A Participant's Guide

Prof. Lynn M. LoPucki
UCLA School of Law
Los Angeles

Prof. Lynn LoPucki is the Security Pacific Bank Distinguished Professor of Law at the UCLA School of Law in Los Angeles and founder of the UCLA-LoPucki Bankruptcy Research Database.
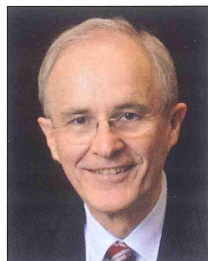
The Success Modeling Project is an experiment designed to answer the most important question in the big-case bankruptcy field: What causes the bankruptcy process to succeed or fail? The project is open-data and multi-researcher. That is, the UCLA-LoPucki Bankruptcy Research Database (BRD) collects and disseminates the data free to researchers throughout the world. Data collection began Feb. 1, 2010, and is now in its third year. The UCLA School of Law has provided the bulk of the project's resources, but the National Conference of Bankruptcy Judges, ABI and the Turnaround Management Association (TMA) endowments have also provided crucial financial support. Our purpose is to provide a concrete answer to the question that defines the project: What causes bankruptcy success—or failure?[1]

There are many methods available for discovering empirically what causes success or failure. Important discoveries can be made by simply ordering data in a table or graph, or by computing statistics such as averages and differences. The term "success modeling," however, implies using more complicated techniques with statistical software. The most important will likely be regression models in which the dependent variables are measures of success and some or all of the independent variables are measures of the factors that cause success. A model predicts or explains success by showing that those independent variables are correlate with the dependent variable.

What is success? We have not tried to impose any particular definition, but rather have collected data for several measures of success. These data include firm financial condition improvement, firm survival, and the value distributed to creditors and shareholders. Project participants should feel free to add their own measures of success.

The independent variables are essentially of two types. The first type measures aspects of the bankrupt company's or the American economy's financial condition at the time of the case. The second type measures characteristics of the bankruptcy case. Both types can be used simultaneously.

1   See Figure 1 for a screenshot of the homepage.

Figure 1

UCLA-LoPucki Bankruptcy Research Database

Download the Complete Bankruptcy Research Database

From this page, ABI members can download complete, up-to-date copies of the UCLA-LoPucki Bankruptcy Research Database (BRD). The download is of three files:

1. The data file in Excel.
2. Protocols for the Bankruptcy Research Database in pdf.
3. What you can do with the Bankruptcy Research Database in pdf.

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NCBJ National Conference of Bankruptcy Judges

TMA

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For example, if a model's purpose is to evaluate the effect of case characteristics on the likelihood or degree of success, the financial-condition variables can serve as controls. Thus a model might evaluate the effect of secured debt or plan prepackaging on success, controlling for prevailing interest rates or the particular company's earnings before interest, taxes, depreciation and amortization (EBITDA).

If a model's purpose is to evaluate the effect of financial-condition measures on the likelihood or degree of success, the case characteristic variables can serve as controls. For example, a model might evaluate the effect of pre-petition leverage or EBITDA on success, controlling for the duration of the case or management turnover.

Participation

Anyone eligible to receive a free copy of the BRD is eligible to participate in the Success Modeling Project, which includes all academics writing for publication and all members of ABI or TMA. To be eligible as an academic, a participant must (1) be affiliated with a university, government agency or nonprofit organization; (2) provide both a university or agency email address and a URL showing the requester's affiliation with the university or agency; (3) identify the research project; and (4) intend to publish the results. (Members of ABI or TMA can participate without these restrictions.)

To participate effectively, researchers will need (1) the BRD, (2) the BRD protocols, (3) a statistical software package (Stata is recommended), (4) a rudimentary knowledge of statistics, and (5) an effective understanding of how the bankruptcy process operates with respect to large public company cases.

Getting started is easy. We post a zip file containing an updated edition of the complete BRD database to the ABI website[2] each month. The data are in two versions: an Excel (.xlsx) file for human browsing and a .csv file for easy importation to Stata. The monthly update comes with two Stata Do Files. If you are working in Stata, edit the "Import.do" file to indicate the directory in which you will work and run the "Import.do" file. Stata will execute both Do files. Execution imports the BRD into Stata, prepares it for analysis and runs a sample success model. Depending on the version of Stata installed, the output will end with one or two regression tables.[3] The first line of this output is the command that generated it: "logit refiler5 DE yearconfirmed PrimeDisp, robust." Researchers can create their own success models by substituting BRD variables in and out of that command line.

The first word of the command line, "logit," specifies a type of regression (logistic) that is used when the dependent variable is true or false. The second word, "refiler5," specifies the dependent variable (whether the debtor refiled within five years after plan confirmation). The next three words, "DE yearconfirmed PrimeDisp" specify independent variables. The first, "DE," indicates whether the case was filed in Delaware. The second, "yearconfirmed," is the year in which the court

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2   *See* UCLA-LoPucki Bankruptcy Research Database, ABI, www.abiworld.org/UCLA_research_database/ abi_draft.html (last visited July 10, 2012).
3   The first is shown in Figure 2.

confirmed the plan. The third, "PrimeDisp," is the prime rate of interest at the time of plan confirmation. The comma after PrimeDisp indicates the end of the variable list. The word "robust" is an instruction as to how the regression is run. The necessity for that word and its precise meaning are beyond the scope of this article, but, as will be apparent from running the command without it, the results would not be much different.

The output shows that emerging companies were much more likely to refile if the prime rate was high at the time of plan confirmation (p<.001), more likely to refile if their plans were confirmed in later years rather than in earlier years, (p=.019), and more likely to refile if their plans were confirmed in Delaware (p=.035). To construct others models, just add, remove or substitute other variables. Researchers who are not themselves statisticians will need help to assure that the type of regression run is appropriate for the types of variables used and that the regression results are correctly interpreted.

Data Available

As of June 2012, the BRD contains 173 variables. The protocols for the UCLA-LoPucki BRD—which are furnished along with the BRD—explain what each variable measures and the source or sources from which we collected it. A one-page list of the variables appears on the first page of the protocols. The names are sufficiently intuitive that researchers will rarely need to reference the protocols once they are familiar with the variables.

Most BRD variables can be used in exactly the form in which they appear in the BRD. Others require preparation. For example, "FeeReviewer" is a categorical variable with seven categories: six kinds of fee reviewers that might have

been appointed, and "no." To use FeeReviewer in a regression, the researcher must first convert that variable into one or more dummy (true or false) variables, each indicating the presence or absence of a category of fee reviewers. Researchers can group the FeeReviewer categories in different ways to yield many more dummy variables than the seven FeeReviewer categories.

Not only can researchers construct several dummy variables from a single categorical variable, they can also construct variables from combinations of variables. For example, by subtracting the date on which the case was filed from the date on which the case was disposed of, the researcher can create a variable that measures the duration of the case. By dividing EBITDA by assets, the researcher can "normalize" EBITDA and perhaps improve its comparability across cases. We have transformed some variables in the BRD and others through commands in the Stata Do Files. Researchers can use Stata to transform more.

The first step in designing a success model is to select or create a variable that measures success. The BRD contains eight categories of variables that can plausibly serve as measures of success: profitability, growth, firm survival, goal achievement, distribution size, leverage reduction, speed and cost minimization. These categories include dozens of variables from which the researcher can construct hundreds of variations.

1. *Profitability*. The BRD contains four measures of the debtor's profitability, at each of two points in time. The measures are net income, EBITDA, EBIT and income before extraordinary items (IncomeBE). A figure for each variable in each bankruptcy case is taken from the last 10-K for a period ending before the filing of the case and the first 10-K for a period ending after plan confirmation.

Figure 2

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.
. logit refiler5 DE yearconfirmed PrimeDisp, robust

Iteration 0:    log pseudolikelihood = -215.33348
Iteration 1:    log pseudolikelihood = -203.77523
Iteration 2:    log pseudolikelihood = -203.36161
Iteration 3:    log pseudolikelihood =  -203.3613
Iteration 4:    log pseudolikelihood =  -203.3613

Logistic regression                              Number of obs   =        451
                                                 Wald chi2(3)    =      23.12
                                                 Prob > chi2     =     0.0000
Log pseudolikelihood =  -203.3613                Pseudo R2       =     0.0556
```

refiler5	Coef.	Robust Std. Err.	z	P>|z|	[95% Conf. Interval]	
DE	.5893655	.2800624	2.10	0.035	.0404532	1.138278
yearconfirmed	.0747188	.0319666	2.34	0.019	.0120655	.1373721
PrimeDisp	.3092166	.073557	4.20	0.000	.1650475	.4533857
_cons	-153.1272	64.19459	-2.39	0.017	-278.9463	-27.30816

2. *Growth*. Reorganization "success" can also be defined as an increase in company size, measured by revenues, assets or employees. The improvements or increases can be measured as proportions ("a 20% increase in revenues") or as normalized changes in dollar amount ("an increase in EBITDA equal to 5% of revenues").

3. *Firm survival*. The BRD contains several variables that measure firm survival. "Emerge" indicates whether the debtor's business continued to operate after plan confirmation. "Refile" indicates whether the debtor refiled for bankruptcy after plan confirmation. "Refile 5" indicates whether the refiling occurred within five years of plan confirmation. Confirmation and refiling dates are available so that the user can easily create a variable that measures the time to refiling. We are in the process of collecting firm survival variables that indicate whether the company continues in business and, if not, the date and nature of its demise.

4. *Goal achievement*. Debtors may declare specific goals at the time the case is filed. For example, the BRD's "SaleIntended" variable indicates whether the debtor stated at the time of filing that it sought to sell the company. If the debtor sought to sell and sold, that can be regarded as success. On the same basis, plan confirmations can be regarded as successes, and dismissals or conversions can be regarded as failures.

5. *Distribution size*. The sizes of the distributions to creditors and shareholders can be regarded as measures of success. The BRD contains variables that measure the amounts of secured and unsecured claims in each case, and the distributions in dollar amount to secured creditors, unsecured creditors and equity. The dollar amounts make it possible to calculate the ratios of distributions to claims ("10 cents on the dollar"), the portions of the distributions going to particular parties, or the ratios of the distributions to other measures of firm size.

6. *Leverage reduction*. A commonly asserted objective of bankruptcy reorganization is to reduce debt to a manageable level. The BRD has two measures of assets and liabilities at filing (10-K or Exhibit A) and one measure of assets and liabilities after emerging. From those variables, researchers can calculate the debtor's leverage at filing, the debtor's leverage after emerging, and the difference between the two.

7. *Speed*. Reorganization speed is not an end in itself. But some regard reorganization speed as success because they believe that speed serves other important objectives. The BRD provides several date fields from which case duration can be calculated in a variety of ways.

8. *Cost minimization*. If reorganization outcomes are not sensitive to the identity of the debtors' professionals or the actions they take, reorganization is merely a commodity. The best reorganization would be the cheapest. "ProfFees10k" is a variable that measures the debtor's total professional fees paid for the restructuring.

Once the researcher has selected a measure of success to serve as the dependent variable, the next step is to select one or more independent variables that might explain the variance in the dependent variable. The BRD contains six categories of variables that measure the financial characteristics or condition of the debtor at the time the case was filed: leverage, profits and revenues, bankruptcy cause, financial structure, company size and industry. In addition, it contains three categories of variables that measure the condition of the economy around

the time the case was pending: interest rates, gross domestic product and the rate of inflation. The BRD also contains 15 categories of variables that measure case characteristics: duration, CEO turnover, 363 sale, case cost, case intensity, court, case type, trustees, examiners, committees, unions, debtor's attorneys, distributions, substantive consolidation and fee reviewers.

If the variables that researchers need are not contained in the BRD, researchers can import them from other sources. The BRD contains GvKeys, Cusips, CIKs, Tickers and other fields that will link to Compustat, CRSP and other databases.

Success Modeling Strategy

To participate in the project, the first step is to decide whether you want to analyze the data personally or with the assistance of a statistician. Keep in mind that statistical analysis does not necessarily mean regression analysis. Researchers can use Excel to compile and graph data, run simple statistics such as medians and means, and compare groups, but if you prefer to work with a statistician, begin by recruiting that person.

The next step is to obtain a copy of the BRD. You can download the latest edition from the ABI website.[4] Skim the database and the protocols to familiarize yourself with the available data. Testing all possible relationships in the data is impossible; there are simply too many of them. You will need a theory as to what counts as "success" and what might be causing it.

Choose a single measure of success on which to focus. Examine the data for that variable to make sure that it varies sufficiently to provide something to explain. If it does, make that variable the dependent variable in all of your early models.

Choose some variable types that when used as independent variables may account for the variance in your dependent variable. Find the protocols for the variables of that type, read them and choose some for inclusion in your first model. If necessary, prepare them for use through simple transformations such as subtracting, dividing, or converting categories to dummy variables.

Run the regression and observe the results. Keep the independent variables that are statistically significant, drop the ones that are not, and add more. Test as many as you think might help to explain your chosen measure of success. Use available statistical tests, such as Adjusted R-Squared, to determine which of your models is best. Consider importing additional variables from sources such as Compustat.

Once you are happy with your model, the next step is to compare it with the models of others. Such comparisons are often mutually beneficial because they suggest ways in which each researcher can improve. The BRD will seek to provide an online forum for these comparisons.

Statistical models alone are not persuasive; they merely calculate and display the levels of correlation among the variables. Those variables purport to capture some aspect of reality. To make their models persuasive, researchers must explain the analogies between their statistical models and the underlying realities—preferably in ways that practitioners can relate to their own experiences. We look forward to a vibrant discussion over the next few years of what causes success and failure in large, public company bankruptcies. abi

4 *See* UCLA-LoPucki Bankruptcy Research Database, ABI, www.abiworld.org/UCLA_research_database/abi_draft.html (last visited July 10, 2012).