

Developments in Business Simulation & Experiential Exercises, Volume 9, 1982

A MERGER AND ACQUISITION SIMULATION

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INTRODUCTION

The objective of this paper is to examine the design and use of a merger and acquisition simulation. The simulation selected for study was developed at the University of Texas at Austin and is currently being used in a graduate managerial strategy and planning course. Basically the simulation generates alternatives which may be used for comparison and evaluations, and for decision making. The computer model was designed so that users of the model could modify the important decision variables that enter into the acquisition process. Dean George Kozmetsky and J. Barry Gertz were primarily responsible for the development of this model.

In order to achieve a desired growth rate, many companies have found it necessary to enter into a merger, acquisition program. During this program they have found that an enormous amount of data must be analyzed within a fixed time period so that a decision can be made as to the impact that a particular acquisition candidate will have on the parent company. During the period of the negotiations, many variables affecting both the acquisition candidate and the parent company will change.

The computer simulation examined provides a working tool for formulating and evaluating alternative growth and diversification strategies. If this process is oversimplified the actual impact that the merger will have on the parent company will become more obscure thus making financial planning, either long or short range, extremely difficult. In order to overcome many of these disadvantages, a model has been developed that takes advantage of the ability of a computer to process great quantities of data within a short time span. The model that has been developed is a long-range merger, acquisition computer model that will optimize the effect that an acquisition will have on the parent company's earnings per share while considering the dividends received and the market value per share of the acquisition candidate's stockholders. The model will produce income statements, balance sheets, and the funds flow statements for the parent company while allowing it to acquire some one to one hundred acquisitions over a ten year period. The model produces four types of outputs; one looking at each company before the acquisition and three that will evaluate the impact that the acquisition(s) will have on the parent company.

The merger, acquisition computer model has been designed to aid the company in a program of planned growth from the time the acquisition candidates are selected to the time the companies are actually acquired. The computer model has been designed so that its users can modify the decision variables that enter into an acquisition without changing the model itself. This flexibility has been provided by allowing the user to specify as part of the inputs to the program all variables which will enter into the decision concerning each particular acquisition. The model has been designed so that the user determines which of the various financial statements are to be produced and the type of output desired. In this manner the user directs all of the operations that the model is to perform.

The user of the simulation is required to develop ten year projections by years of sales growth, gross margins on sales, tax rates on income, payout ratios, and price/earnings ratios. The average interest on debt for the acquiring company is also projected. Preference as to the financial arrangements desired by acquiring company are a part of this input data.

Projections of the future financial and marketing performance of prospects for acquisition are based on historical performance and on estimates of future trends and performance. The simulation output provides the data necessary to analyze performance and establish trends which can be used as indicators of the future performance of prospects for acquisition.

The model will generate financial statements by years for ten years for the parent company (the acquiring company), statement by years for each of the acquisition candidates, and a consolidated financial statement by years for the combined companies. The financial statements generated can be used to identify the various alternatives and in selecting the alternatives that best satisfies the goals, objectives, and strategies of the acquiring company.

The Base Case statements are financial projections based on the input data for each company. The projections are used to calculate an income statement, balance sheet, and funds flow statement for each company before any acquisitions take place. This output allows the user to check the validity of the input data that he has prepared to ensure that the projections he has made are reasonable and consistent. The primary reason for developing a Base Case for each company is 50 that the ten (10) year financial projections can be stored and used whenever the company is acquired. This alleviates the problem of requiring the user to specify the year and the sequence that the candidates will be acquired while he is developing the input data. The entries goodwill, written-up assets, surplus, depreciation of written-up assets, and amortization of goodwill are all zero. These entries are associated with the accounting performed during an acquisition run only.

ASSUMPTIONS AFFECTING ACQUISITION

When the parent company acquires one of the candidates, the purchase price and terms of exchange of the acquisitions are based solely on the candidate company's common stock with the candidate's existing preferred stock and debenture issues taken on by the parent company as a burden. When the acquired burden is convertible, a new preferred-to-common or debenture-to-common rate is determined for the parent company. The model assumes that during an acquisition the stockholders of the acquired company will receive only cash or debentures. They will never receive both. In the model the cash portion of an exchange consisting of cash or debentures is treated as a purchase of assets while the equity portion of the exchange is treated as a pooling of interest. When a combination of cash and equity are used in the exchange, the model treats the exchange as a combination of the two accounting procedures.

This presentation concerns an experimental integrative

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course at the M.B.A. level which utilizes group simulation of the strategic planning and control decisions involved in the initiation and development of a new firm, a merger and acquisition simulation, and a portfolio management simulation developed at the University of Texas in Austin.

The major objective of the course was to involve students in strategic planning and control decisions at the executive level. Specific objectives were to develop an analytical and usable framework of the major managerial concepts, and to analyze the activities of managerial planning and control and the development of business strategies.

This assignment involves both the decisions made by top management and operations managers;

Identifying and analyzing prospective industries.

Evaluating and selecting an industry for entry.

Establishing a basic company.

Developing an integrated 10 year plan.

Long-range (10 year) projectives of growth, financing, sales, stock prices and profits.

Establishing degree of vertical integration.

Developing a merger and acquisition strategy and plan.

Acquiring the needed resources and technologies.

Developing a series of exhibits of the elements of the strategic plan for use in oral and written presentations.

The first of each group is to identify and select an industry for group project discussion with your instructor. Please have selections approved by instructor.

In identifying prospective firms for acquisition, students used a computer program and compustat data. Working capital per share, current assets per share, and whether or not book value per share was greater than market value per share, were used as criteria in filtering the potential prospects. If any of these indicators were greater than stock prices, the firm was listed as a prospect. Other measures used in a more discriminating screening were whether or not long-term debt was less than 5% of total assets. The computer program also provided additional and more detailed information on dividend yield, inventory turnover, pension expense per year in millions, and long-term debt in millions.

This requirement entailed an analysis of a suitable industry as well as some definition of the parameters of the industry being considered. The requirement also called for a consideration of the major criteria both in the development of an ownership strategy and in the making of acquisition decisions. In addition, it involved a long-range projection of broad objectives, and the setting of priorities for the various phases of the strategic plan. The selection of an appropriate strategy by each group called for an evaluation of various feasible alternatives in marketing, production, research, investments, acquisitions, and finance. The intent of this assignment was to bring about the development of a strategic plan which clearly stated the issues and proposed suitable strategic alternatives in the light of these issues.

Each group first had to determine the industry in which it would like to start a new enterprise. Once this decision had been made, a comprehensive strategic plan for the firm had to be developed.

Output 1 - Most Likely Exchange Terms

On data cards 18, 19, and 20 there are entries where the user will specify the most likely terms of exchange that are to be associated with each acquisition. When the Output Request Card specifies that Output 1 is desired, the most likely terms

of exchange are used within the analysis in generating a total financial picture of the combined company. This output contains a ten year income, balance sheet and funds flow state-merits for the combined company after the specified acquisitions have occurred. This output allows the user to ascertain the impact of the proposed acquisition(s) on the parent company's financial statements. By changing the sequence and the year in which the candidate(s) is to be acquired, the user can analyze the impact that will be made given the various alternatives open to him. A sample of this output is given on page A7 of the Appendix.

Output 2 Capital Structure Planning

In order to aid the user in determining the best terms of exchange for an acquisition, Output 2 has been designed. This analysis will be performed when a "2" is punched on column 5 of the Output Request Card. This output has been designed to aid the user in his capital structure planning during the acquisition program. Given several constraints, the analysis will determine the optimum percentage of debt (or cash), common stock and preferred stock to be used in acquiring a company. This analysis will also use the Sequence of Acquisition and Year of Acquisition cards as described previously. In addition to these, the user is required to specify on a third card the maximum percentage of debt to total investment that are to be allowed over the next 10 years (Total investment is net worth plus long term debt). To give an example, if the maximum % of debt and preferred desired are 0.20 and 0.10 respectively, and if companies 1, 2, 3 and 4 are to be acquired in years 3, 4, 5 and 8 respectively, the output request deck would appear as follows:

	Columns	5	10	15	20
Output Request Card		2			
Sequence of Acquisition		1	2	3	4
Year of Acquisition		3	4	5	8
Capital Structure		0.20	0.10		

The percent of debt and percent of preferred that the user indicates are primary constraints used within the analysis. On cards 18 and 19 of the input data deck for Each acquisition candidate, the user has been asked to specify the maximum and minimum percentage of cash, preferred stock and common stock that can be used in the exchange. He has also been asked to indicate an increment amount in order that the analysis tests various percentages between the minimum and maximum amounts. For example, if the minimum was specified as 20% and the maximum as 60%, and if the increment was specified as 10%, then the tests would be performed using 20, 30, 40, 50 and 60 percents. Given these constraints, Output 2 will indicate the maximum percentage of debt and preferred stocks to be used in acquiring a company.

In order for this analysis to be performed properly, the following two criteria must be met:

1. The minimum % of preferred specified for an acquisition (card 19) 1.00 minus the maximum % of cash (card 18) minus the maximum % of common (card 19).
2. The minimum % of common (card 19) 1.00 minus the minimum % of cash (card 18) minus the minimum % of preferred (card 19)

If either of these two requirements is not met, the results obtained from Output 2 will be of no value in determining the terms of exchange. A sample of this output is given on page A8 of the Appendix.

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Outputs 31 to 63 - Terms of Exchange

In order to help the user find the best terms of exchange associated with each acquisition, Outputs 31, 32, 43, 51, 52, 53, 61, 62, and 63 have been designed. The analysis associated with each of these outputs focuses the attention on the user on the effects that the last acquisition will have on the parent company's earnings per share and on the acquired company's stockholders dividends per share and market value by allowing the percentage of cash, preferred stock and common stock associated with each exchange to vary from the minimum percent to the maximum percent as specified terms of exchange that he feels is reasonable and would be acceptable to the acquisition candidate.

Output 31

This output lists the parent company's earnings per share after preferred dividends before the last acquisition and shows for a various terms of exchange the modifications that would result in the EPS figure after the last acquisition. A sample of this output is given on page A9 of the Appendix. Notice that this output would only give the effect of the last acquisition on the EPS of the parent company. In this example, since company 4 is the last acquisition and is acquired in year 8, it would have no effect on the parent company's EPS from years 1 through 7. Therefore the EPS figures in each column are identical. The last acquisition in year 8 has caused dilution to the parent's EPS, therefore starting from that year, the output shows for a various terms of exchange the modifications that would result in the EPS figure.

If the user wishes to study the effects of all the acquisitions on the parent company's EPS, he would have to submit the following cards:

Output Request Card	---31
Sequence of Acquisition	---- 1
Year of Acquisition	---- 3
Output Request Card	---31
Sequence of Acquisition	---- 1----2
Year of Acquisition	---- 3----4
Output Request Card	---31
Sequence of Acquisition	---- 1----2----3
Year of Acquisition	---- 3----4----5
Output Request Card	---31
Sequence of Acquisition	---- 1----2----3----4
Year of Acquisition	---- 3----4----5----8

(- = 1 space)

As mentioned before, all the numbers are to be punched as integers in fields of 5 columns.

Output 32

This output lists the parent company's EPS after conversion of all overhang stocks, i.e., after all the convertible debentures are converted. The EPS figures before the last acquisition and the modifications under the various terms of exchange that would result after the last acquisition are listed. As in Output 31, this output would only give the effect of the last acquisition. In order to study the effects of all the acquisitions on the parent company, the same procedure as discussed under Output 31 has to be done. A

sample of this output is given on page A10 of the Appendix.

Output 43

This output produces a variety of numbers and ratios as a result of an exchange involving equity plus cash. Again this output, like Output 31 and 32, would only give the terms of exchange for the last acquisition candidate. The same procedure as described under Output 31 has to be done if the user wants to list the terms of exchange for all the acquisition candidates.

Outputs 51, 52 and 53

Outputs 51, 52 and 53 show the equivalent dividends received by the last acquired company's common stockholders after the acquisition, as well as the dividends they could have expected had no merger occurred, under an all equity exchange, an all cash exchange and an equity plus cash exchange respectively. Samples of these outputs are given on pages A12, A13 and A14 of the Appendix. Notice that DPS before acquisition is the dividends for each common stock of the acquired company. In Output 51, the DPS after acquisition is the sum of dividends from preferred and common stocks of the combined company that each common share of the acquired company would receive after the acquisition, since both preferred and common of the combined company are used in exchange for the acquired company's common stock. In Output 52, the DPS after acquisition is actually the interest that each common share of the acquired company would receive, since the analysis is done under an all cash (or debt) exchange. In Output 53, the DPS figure after acquisition is actually the sum of preferred dividends, interest and common dividends that each share of the acquired company gets, as debt (or cash), preferred and common stocks of the combined company are used in exchange for the acquired company's common stock in the analysis.

As in Output 31, these 3 analyses would only give the DPS figure for the last acquired company. In order to study the DPS figures for all acquired companies, the same procedures as described under Output 31 has to be used.

Outputs 61, 62 and 63

These three outputs exhibit the market value of the debentures, preferred stock and common stock of the combined company that would be held by each share of the last acquired company. Output 61 would exhibit the sum of the market value of the preferred and common stock held by each share of the last acquired company. Output 62 would give the amount of debt issued to each share of the last acquired company. The combined company's preferred and common stocks would be valued at their projected market values at the time the exchange takes place.

As in Output 31, the same procedure described has to be done if the market value of the combined company held by each share of every acquired company is to be studied. Samples of these outputs are given on pages A15, A16 and A17 of the Appendix.

Output 7

This output will inform the computer to terminate the program. Hence the two direction cards (Sequence and Year) are not to be used in requesting this output.

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IV. SUGGESTED USE OF THE OUTPUTS

The outputs of the model are played off against each other in order to move the parent company through the acquisition program.

1. Develop a corporate growth plan with definite objectives. Obtain the Base Case Output for parent company and acquisition candidates to compare the forecast of the parent with its stated objectives.
2. Develop an acquisition growth strategy. At this time the user should fill in the terms of exchange so as to allow a wide range between the minimum and maximum amounts. The most likely terms of exchange are to be those the user desires. Examination of Output 1 in order to ascertain the impact of a proposed acquisition program on the parent company.

Review of Output 1 and examination of Output 2 to establish the acquisition candidate selection criteria.

3. Screen the acquisition candidates.

Through examination of the Base Output of each company, narrow the possible candidates to be acquired.

4. Analyze the financial impact of acquiring a company. Determine the range of terms of exchange that would be favorable to both the parent and the acquired company stockholders through examination of Outputs 30's to 60's.

Calculate the terms of exchange to optimize the parent company capital structure goals. This is done through the use of Output 2.

Repeat Step 2 to analyze the impact that the sequence of acquisition and the year of acquisition of a group of candidates will have on the parent company's total financial picture. At this point the user can specify the minimum and maximum amounts with more precision and with the information that he has received from prior outputs, he will be able to zero in on the most likely terms of exchange to be used in Step 2.

5. Further examination of candidates selected. Collect more specific and detailed information on the acquisition candidates filling in all missing data.

Ascertain the desired terms of exchange between the candidate and the parent.

6. Construct more detailed analysis.

Repeat the analysis performed in Step 2 and 6 using the refined information from Step 5.

7. Integrate the candidate into the parent.

Adjust the parent company's capital expenditure budget in light of the acquisitions decided upon through the use of Output 1.