

## A FINANCIAL SIMULATION OF A PROPOSED COMPUTER LEASING COMPANY

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### Summary

This paper describes a simulation to analyze and forecast the financial posture of a computer leasing company as a subsidiary to a large corporation.

The intent of this paper is to describe and evaluate a method of analyzing the risk of entering a certain business line, not to arrive at or recommend a particular decision.

The paper describes a simulation of the financial position of a hypothetical, and proposed, computer leasing subsidiary, considered as a spinoff from a large parent corporation having a heavy demand for computers.

The marketplace in which the Subsidiary would function is complex, dynamic, and competitive, with significant competition among leasing companies as well as between lessors and manufacturers. The Subsidiary would have a share of this marketplace in addition to an assumed internal, inherited, market which is growing and changing. These circumstances would be augmented by a financial posture with various alternatives as regards depreciation schedules, loan payment schedules, and cash flows. These alternatives are evaluated as they affect corporate profit, earnings per share, and return on investment (ROI).

A five year model was designed, and a computer program for Monte Carlo simulation of the model was written.

To carry out the Monte Carlo simulation three major steps are taken:

- 1) The range of values for each factor is estimated, and within that range, the probability of occurrence of each value is computed.
- 2) Selecting at random a particular value for each factor, the financial results for that set of circumstances is calculated.
- 3) The calculation of 2) is repeated many times, reselecting at random the value of each factor.

As final output, the financial simulation produces the mean and range of financial results under every set of circumstances studied, rather than a single (or few) points within the entire range of expectation. The range is given in terms of the 10 and 90 percent quantile points.

The procedure consists of defining the Subsidiary's market, and considering the effects on that market of events such as hostile acts by manufacturers or competitors, and the advent of fourth generation hardware. From these considerations, a financial statement for the Subsidiary is prepared.

The simulation program samples from a distribution to obtain a rate of growth of the computer hardware industry in the United States for each year. From these rates a scenario, depicting the total computer market as a function of time, is constructed. The 1967 level was used as a base.

The third party computer leasing market (CLM) is computed as a share of the total leasing market. This computation is based on an industry study.

The two marketplaces for the proposed Subsidiary, viz the external one, and that within the parent corporation, are estimated. The internal market is considered to grow as the projected growth of the parent company, with start value taken as the dollar worth of equipment currently in-house. The external market for the subsidiary was taken as a share of the total CLM.

It was believed that the present growth of the computer leasing industry would not be sustained, and that actions by manufacturers or by the leasing industry itself would impede the growth of CLM in particular. To reflect this belief in the simulation, a probability distribution was sampled for the year in which a "hostile act" would occur. For the "year of the hostile act," and thereafter, the growth rate of the CLM remains the same as the computer market. The project of CLM is then recomputed.

We randomly select from a probability of the dates of Advent, a year for the introduction of the fourth generation of computers. Revenues are analyzed differently for the years following Advent.

A financial statement is prepared for the Subsidiary, giving the return on investment (ROI), return on investment for net worth, earnings per share, revenues before and after taxes, outstanding loans, interest payments, and other parameters of importance.

The particular values and distribution input to the procedure cover a wide spectrum of data. The market must be described, the probable dates of events affecting the market must be selected, and the financial policies of the subsidiary must be detailed.

The total computer market for a given year is taken as the sum of manufacturers' selling prices for all digital computers and related equipment in use in the United States in that year. Eighty percent of the total computer market is in leased equipment; this value does not change.

The internal computer market is estimated by establishing the present worth of internal equipment on hand, and extrapolating the internal demand, will grow at the rate (a random variable in our study) of the external market.

The second step of evaluating the external market for the Subsidiary is to estimate its share of the "third party market" determined in the first step.

Financial constants and policies were the following factors: rental revenue, expenses, debts, and investment of the Subsidiary and the handling of taxes.

Two basic cases were studied. The first was constituted by the Subsidiary with internal business and external business. For each of two loan structures (the 70% and 90%) investigated, constant debt-to-equity ratio was implicit due to the pay-back schedule. Moreover, two kinds of rental reduction, due to the introduction of fourth generation hardware, were considered: the expected rental reduction, and severe reduction due to extreme obsolescence of third generation equipment. In some of the cases a corporate policy of buying no additional hardware after advent of fourth generation hardware was considered. The second case was similar to the above, but with no external business allowed.

Five key measures per case considered were presented as indicators of the financial status of the Subsidiary. These were:

1. the Subsidiary's investment;
2. income after Federal income tax;
3. ROI on net worth, where returns are after taxes;
4. subordinated notes;
5. discounted cash flow.

The first four measures were plotted against time over the five years of the study, affording four useful graphs (see Figure 1). The discounted cash flow was computed over the entire period for each of the many simulations; the resultant measure is given as a cumulative distribution.

The procedures described in this paper proved useful to a management in answering such complex questions as, "What are the effects of the introduction of fourth generation hardware?," "Of hostile acts by manufacturers?," and questions of various financial policies. The procedures also revealed areas which needed further exploration with more precise assumptions. Using this approach to risk analysis of a business venture, one cannot only project corporate activity and evaluate whether the venture constituted a worthwhile investment, but once the venture is launched, the model could serve as an exciting management tool for continuous monitoring and forecasting.

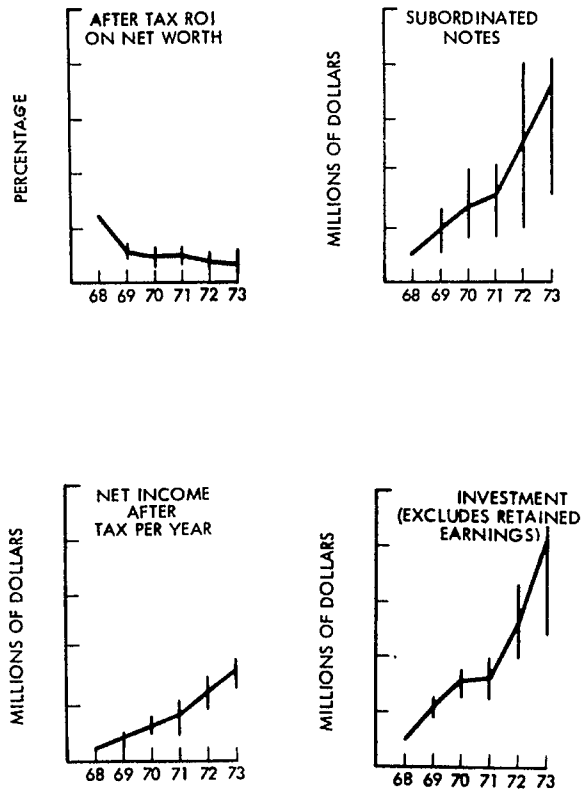


Figure 1. Sample Output for a Case Study