

THE VALUATION OF CONGLOMERATE COMPANIES

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THE VALUATION OF CONGLOMERATE COMPANIES

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CHAPTER I

INTRODUCTION

Business combinations (generically referred to as mergers) are not a new phenomenon in the United States. Since 1900 there have been three distinct movements, and each of these movements has had its unique motivating forces.

The first wave of mergers occurred near the turn of the century and was apparently motivated by desires of businessmen to limit competition from similar firms. Since the motivating force is manifested in the form which the merger assumes, it is not surprising that the dominant form of this period was the horizontal one, in which similar firms were combined.

The second major merger movement occurred during the period from 1917 to 1929. Undoubtedly a certain amount of the merger activity of this period was speculatively motivated. The emergence of the massive public utility holding companies during this period is probably adequate evidence of such motivation. However, other mergers occurred which were the results of attempts of businessmen to assure themselves of dependable sources of supplies, or alternatively, to attain efficiencies in distribution processes. When

motivated by these latter factors, the combinations which resulted were of the vertical or circular variety.

In the third merger movement (1948 to the present) the motivating factors and realities are not quite as clear as in the former cases because as complete a historical perspective is not yet available. Several aspects of this most recent movement, however, are becoming apparent. First, while some of the activity is of the horizontal, vertical, and circular variety, there is an increasing tendency for firms operating in different markets to be joined together into conglomerate-type companies.¹ Furthermore, this mode of expansion is gaining momentum in the 1960's, as the following quotation indicates.

Some new statistics on the galloping merger movement sent echoes through Washington this week. Even antitrusters were startled by the totals in the Federal Trade Commission's annual report on corporate mergers. Its highlights:

During 1967, mergers among U.S. companies humped 37% to an all-time high of 2,384.

Acquisitions of large companies with assets of \$10 million or more dominated. There were 155 of these large acquisitions last year, compared to 101 in 1966. Of the 155, conglomerates accounted for 128, up from 75 in 1966.

Companies with assets over \$100 million acquired 62% of the large companies involved in mergers; these companies acquired more than \$6.3 billion, or 79% of the assets.²

¹See page 34 for a definition of conglomerate merger.

²"Measuring the Surge of Mergers," Business Week, No. 2013 (March 23, 1968), p. 69.

It is possible that conglomerates are being created because businessmen are unwilling to make heavy commitments of resources to basic research unless they are somehow guaranteed a degree of size and stability of earnings not attained by a firm operating in a single market. Another of numerous possibilities is that in a technically complicated environment such as today's, the level of managerial skill demanded has made management a scarce commodity. Under these conditions it is possible that diverse firms joined together under a single management could operate more efficiently than the components alone. In any event, the precise forces underlying the current movement are uncertain, and the fore-mentioned reasons are mentioned only because they represent plausible possibilities.

Statement of the Problem

A basic question remains unanswered--Is the current merger trend resulting in improved income potential of the combined resources, or is it merely the manifestation of promoters' desires to make a quick profit? This question and others remain largely unanswered because traditional methods of analysis are not applicable to conglomerate companies. This lack of applicability has left a gap in the ability of investors to identify conglomerates of investment-grade quality.

Valuation techniques traditionally used in the analysis of companies operating in a single industry cannot be appropriately applied to conglomerates for the following reasons:

(1) The operating data for conglomerates are usually furnished on a consolidated basis only. (If operating results were provided for each subsidiary, then each might be valued independently.)

(2) Diversification of earnings is often cited as one of the advantages of conglomerates as an investment; however, no tools are available for placing a value on this characteristic (i.e., the quality and stability of total earnings from diversified sources).

(3) Current earnings and projected changes in earning levels are the two main independent variables used in traditional methods of valuation. For several reasons difficulties are encountered when attempting to project the earnings of conglomerates. First, most conglomerates have emerged in recent years and have not been tested by adverse business conditions. Second, the earnings reported by conglomerates are derived not only from operating sources but also from acquisitions. For example, LTV, in the period 1957-1966, increased its total earnings by 3,900 percent³-- a growth rate that would be very difficult to attain by

³James C. Tanner, "Ling's Empire," Wall Street Journal, CLXX (August 18, 1967), p. 1.

internal means alone. Furthermore, this mode of growth can be transferred to parent company shareholders if subsidiary companies are obtained under favorable financial terms. Accordingly, on an overall basis or on a per-share basis, earnings of conglomerate companies can be greatly influenced by the mere act of acquiring resources from external sources.

It is possible for a conglomerate company to augment its income from operations by making acquisitions. That is, changes can occur in reported income and profitability because of both operating and acquisition activities. Furthermore, a company relying solely on acquisitions can create an upward trend in profitability as measured by rate of return on investment. Not only is it possible for increases in rates of return on investment to be passed on to common stockholders, but also, such increases can be greatly magnified in terms of earnings per share. Such impressions of growth can occur when, in reality, the productivity of resources employed is declining. The source of the deception lies in the calculation of growth rates relative to the past time period and not relative to the past rate of return on the resources employed (i.e., traditional calculations are not geared for companies which acquire most of their productive resources second hand).

Hypotheses

To facilitate the investigation of the sources of growth which are available to conglomerate companies and to draw some limited conclusions with regard to which are the major sources, several hypotheses are presented and tested. These hypotheses are as follows:

(1) Conglomerate companies listed on the New York and American Stock Exchanges acquiring the highest proportion of publicly owned subsidiaries in the period 1961-1967 have added negative value to them--where positive or negative value added is measured relative to the weighted average of the rates of return on book values of the resources employed by the subsidiary companies prior to their acquisition. Accordingly, negative value added is defined as the extent by which the projected rate of return on investment exceeds the rate actually experienced.

(2) The value added by conglomerate companies during the period 1961-1967 has tended to decrease from year to year as size and diversification have increased--where diversification is measured by the number of different industries in which resources are employed, and size is measured in terms of the book value of consolidated assets. (The decrease in value added can be from negative values to more negative values or from positive values to less positive values.)

(3) Based on a projection of past acquisition policies, past weighted average growth trends of parent and subsidiary

companies, and the same percentage of value added by parent company organizations, the current market prices of the common stocks of conglomerate companies are too high if an 8 percent rate of return is demanded.

(4) If the conglomerate companies surveyed are grouped into (1) those adding the most value (relative to the other companies) and (2) those adding the least value, then the companies in each group will tend to have similar acquisition strategies. Acquisition strategies for this purpose are defined in terms of the relative rates of return and growth rates of subsidiaries and parent companies at the time of acquisition.

The testing of the hypotheses is intended more as a vehicle for illustrating the possible avenues of growth available to conglomerate companies than as a means of drawing conclusions of a general nature. The results derived in testing the hypotheses are of limited validity for at least two reasons. First, the companies used in testing the hypotheses are not selected in a statistically random manner, but rather, consideration is limited to a few of the companies which have acquired a relatively large number of publicly owned companies. Also, in testing for "value added" attention is directed only to the publicly owned companies acquired by a particular conglomerate company and not to all of its acquisitions.

Sources of Data

The data used for testing the hypotheses are derived from several sources. The major source is Moody's Industrial Manuals; however, reference is also made to the 10-K reports filed with the Securities and Exchange Commission, to annual reports of the specific companies, and to numerous professional journals. Also, Moody's Handbook of Common Stocks and Standard and Poor's Security Owner's Stock Guide are used to determine price-earnings multiples and prices of shares which prevailed in different years.

Significance of the Investigation

The rapid growth rate in the size of individual conglomerate companies coupled with the absence of adequate tools for their analysis has created problems of increasing dimensions for investors and public-policy makers alike. That is, as the conglomerate form of organization has continued to grow, the problems of analysis which they present have also been compounded.

Almost all of the investigations conducted to date by academicians and public-policy makers have proceeded along traditional lines. Accordingly, such investigations have not given recognition to the unique characteristics of conglomerate companies. The major significance of this investigation is that it does recognize the uniqueness of conglomerate companies, and the conclusions derived, if they

are valid, can be helpful in making future decision making more meaningful.

Approach

The investigation is structured on the basis of a set of relationships which are derived and expressed in succeeding chapters. The general format of the investigation is to develop basic concepts and relationships in the initial chapters, and in subsequent chapters to make added refinements which will clarify all of the sources of growth available to conglomerate companies. Finally, after all of the relevant factors influencing the growth potential of conglomerate companies have been recognized, a method for valuing the shares in conglomerate companies according to the present value criterion is illustrated.

The approach used in the investigation can perhaps be best summarized by a brief examination of the basic relationships which are derived and expressed in the form of mathematical equations. All of the equations and their related implications are discussed briefly in the subsequent paragraphs. The equations are as follows:

$$(1) \quad Y_a = \frac{T_{es}(1+g_s)^t \cdot Z + E_p(1+g_p)^t \cdot Y}{Y + Z}$$

$$(2) \quad T_t = \frac{E_p(1+g_p)^t \cdot Y}{Y + tZ} + \sum_{k=0}^{k=t-1} \frac{T_{es}(1+g_s)^k \cdot Z}{Y + tZ}$$

$$(3) \quad E_{gt} = \frac{(T_{es} - Y_t^*)Z}{Y + tZ}$$

$$(4) \quad Y_t = \frac{(1-T) [(I_p)(R_{I_p}) + \sum_{a=0}^{a=n} (I_a)(R_{I_a}) - (R_d)(D)] - (R_p)(P)}{S}$$

$$(5) \quad R_t = \frac{K(I_p)(R_{I_p}) + \sum_{a=0}^{a=t} I_a(1+gI_a)^{t-a} \cdot R_{I_a}(1+gR_{I_a})^{t-a}}{I_p + \sum_{a=0}^{a=t} I_a(1+gI_a)^{t-a}}$$

$$(6) \quad Y_t = \frac{(R_o)(I_o) + \frac{(\Delta R_{tx})}{\Delta I_t} \frac{(\Delta I_t)}{\Delta t} (I_o)(t-t_o) - (R_p)(P_o)}{S_o}$$

$$(7) \quad E_{pv} = \sum_{n=1}^{n=m} (P_{rn})(PV_n)$$

Equation (1) is used to define the effects of various acquisition strategies on earnings per share. In this equation Y_a represents future levels of earnings per share which result from trading Y shares of a parent company for the shares of stock of a desired acquisition candidate. T_{es} refers to the earnings per share of the acquired company after the shares of the parent company have been traded for its shares, Z refers to the number of shares of stock outstanding in the parent company prior to acquisition of the additional company, g_s is the growth rate of the parent company's earnings per share, E_p is the earnings per share of the initial parent company, and t is time, measured from the point of acquisition.

As explained more fully in Chapter II, if T_{ES} is greater than E_p , there will be an immediate increase in earnings per share from acquisitions; also, depending upon whether or not g_s is greater than g_p , the combined operating trend will be improved or diluted following acquisition. Based upon the relative values for T_{ES} , E_p , g_s , and g_p --six possible acquisition strategies are defined, and resultant values for Y_a are presented graphically.

Equation (1) is used to define the results of single acquisitions, whereas equation (2) represents the effects on earnings per share (Y_t) of sustained acquisitions when relative values for T_{ES} , E_p , g_s , and g_p are assumed to remain constant. Using equation (2), various possible growth patterns are illustrated graphically. Of these patterns, the most significant is the one illustrating that growth through acquisitions alone cannot be sustained indefinitely. That is, when T_{ES} is greater than E_p but g_s and g_p are negative, only a temporary positive growth trend can be established.

Equation (3) is used to show that even when both acquisition income and operating trend are positive (i.e., when T_{ES} is greater than E_p and g_p and g_s are both positive), the growth pattern in the early periods of acquisition cannot be maintained unless the size, rate, or terms of acquisitions are continually improved. Accordingly, regardless of the values for T_{ES} , E_p , g_s , and g_p --the growth trends developed

in the past by conglomerate companies are not necessarily a meaningful basis for making future projections.

Equation (4) is used to introduce additional variables which influence earnings per share of conglomerate companies. Using this equation, attention is directed to rates of return on investment and total investment; accordingly, attention is directed away from a "per-share" orientation. In equation (4) T refers to the income tax rate, I_p is total investment of the initial parent company, R_{I_p} is rate of return on investment of the initial parent company, I_a is the average size of investment of future acquisitions, R_{I_a} is the rate of return on investment of future acquisitions, R_d is the average rate paid to debt in the future, D is the total amount of debt employed, R_p is the rate paid to preferred stock holders, P is the total amount of preferred outstanding, and S refers to the total number of common shares outstanding.

Equation (4) is used to illustrate how a parent company with a declining rate of return on investment could show a positive trend in rate of return on investment in spite of its continued acquisition of companies whose rates of return on investment were also declining. Furthermore, it is shown how the false impression of growth can be transferred to earnings per share and possibly magnified by changes in R_d , D , R_p , P , and S .

Equation (5) is introduced to test whether or not value was added by a selected group of conglomerates to the publicly owned companies which they acquired. Value added was considered positive anytime that K in this equation was greater than one, and value added, negative, anytime that the value for K was less than one.

Equation (6) is used to project future levels of earnings per share under the assumption that future changes in rate of return on investment after taxes will remain the same as in the past. In this equation R_{tx} refers to rate of return on investment after taxes, I_t refers to total investment, and $\frac{\Delta R_t}{\Delta I_t}$ is the rate of change in return on investment per unit of investment. Also, t refers to time, and $\frac{\Delta I_t}{\Delta t}$ represents the rate of change in investment per unit of time. All of the variables with subscripts of "0" are values which exist in the year that valuation occurs.

Equation (6) is used to estimate the investment value of the shares of a selected group of conglomerates under the assumption that such value is derived from the sale of the stock at the current price-earnings multiple after a ten-year holding period. Using these results, an attempt is made to determine whether or not such stocks are currently over-valued.

Finally, in the last chapter, equation (7) is used to show how the shares of stock in conglomerate companies can be

valued in accordance with the "resent-value" criterion. In this equation E_{pv} refers to expected present value, m represents the number of sets of future conditions which are considered relevant possibilities, and P_{rn} is the present value of the stock under the assumption that conditions "n" actually exist.

CHAPTER II

SIMPLE RELATIONSHIPS UNDERLYING ACQUISITIONS

A simple example should clarify how a conglomerate company, through its acquisition strategy, is able to give the impression of being a growth company when it is actually declining in terms of growth in earnings of the resources employed. Assume, for example, that a parent company has 30,000 shares of common stock outstanding and earns income at the rate of \$10 per share per year with no growth. Assume further that the company acquires one additional subsidiary in each of four consecutive time periods, and that the subsidiaries acquired have 10,000 shares outstanding. Assume also that each subsidiary earns \$20 per share in the year it is acquired, and that each one has a negative growth trend in earnings per share of \$2 per year. Finally, assume that the investment community views the parent company's earnings record as indicative of future growth, and that its stock is selling at a high enough price so that it is able to acquire the shares of the four companies by swapping shares of stock on a one-for-one basis. Under these conditions, the results found in Table I were obtained.

The average increase in earnings per share attributed to the parent company's stock is roughly 9 per cent per

TABLE I
EFFECTS OF ACQUISITIONS ON PARENT COMPANY

	Period 0	Period 1	Period 2	Period 3	Period 4
Earnings from subsidiaries		\$200,000	\$200,000 180,000	\$200,000 180,000 160,000	\$200,000 180,000 160,000 140,000
Earnings from parent company	\$300,000	300,000	300,000	300,000	300,000
Total	300,000	500,000	680,000	860,000	1000,000
Shares outstanding	30,000	40,000	50,000	60,000	70,000
Earnings per share	\$10.00	\$12.50	\$13.60	\$14.34	\$14.30

period, as shown on the bottom line of the above table. This growth trend appeared in spite of the fact that the real productivity of the resources employed was declining. Not only are the earnings reported misleading, but also, the valuation placed on the stocks will likely be out of line relative to real growth potential.

Assuming that the market value of the subsidiary company's shares in the year of acquisition is eight times current earnings, then the parent company multiple could be assumed to be around sixteen, since acquisition occurred on a two-for-one basis in terms of current earnings. If these

assumptions are true, the values of the shares before acquisition and afterwards are given by the following:

TABLE II
VALUES OF SHARES BEFORE AND AFTER ACQUISITION

	Period 0	Period 1	Period 2	Period 3	Period 4
Parent before acquisition		\$160.00	\$200.00	\$217.60	\$229.49
Subsidiary before acquisition		160.00	160.00	160.00	160.00
Parent after acquisition		200.00	217.50	229.49	228.80
Subsidiary after acquisition		Same as parent	Same as parent	Same as parent	Same as parent

The implication of the foregoing discussion is that any investment in the shares of conglomerate companies should be made only after a clear distinction has been made between operating earnings and earnings derived from acquisition. This separation is necessary if one is to place meaningful values on such shares. The next section of this thesis outlines some of the basic relationships needed for analysis of conglomerate companies.

Relationships Underlying Single Acquisitions

Definition of terms:

E_p . . .	Current earnings per share of parent company
E_s . . .	Current earnings per share of company to be acquired
T_{es} . . .	Earnings per share of company to be acquired after shares of the parent company have been traded for its shares
g_p . . .	Growth rate of parent company
g_s . . .	Growth rate of acquired company
Y . . .	The number of shares of the parent company before acquisition
Z . . .	The number of shares traded of the parent company for those of the acquired company
E_g . . .	Earnings per share added to the shares of the parent company because of the acquisition
Y_s . . .	Projected earnings per share of the acquired company considered separately after acquisition
Y_p . . .	Projected earnings per share of the parent company considered separately after acquisition
Y_a . . .	Actual earnings per share projected for the parent company and the acquired company combined

The symbols above are used to describe some of the basic relationships inherent in any combination. The situation described is a simple acquisition in which a certain number of common shares of the parent company are traded for those of the company being acquired. While the conclusions apply to the specific situation described, the same general results

can be obtained for more complex arrangements by making slight modifications in the basic models.

Income Effect

In any acquisition involving a simple trade of common stock, so long as T_{ES} is greater than E_p , there will be an immediate increase in the earnings per share of the parent company. On the other hand, if E_p is greater than T_{ES} , there will be an immediate dilution in earnings per share of the parent company. The use of the income effect in a positive manner by the parent company is easiest when the parent company has a higher price-earnings ratio than the company being acquired. Under these conditions, the parent company is normally able to trade fewer shares relative to earnings than it receives.

In addition to data regarding the current earnings per share of both parent and subsidiary company, as well as information about the number of shares traded between the two companies, a more complete description of the combination requires a specification of the expected growth rates of both companies.

In terms of relative growth and relative earnings per share, there are six possible configurations which a combination might assume. These configurations are

- (1) $g_s = g_p$
 $\left\{ \begin{array}{l} (1)_a \text{ Positive Immediate Income Effect} \\ (1)_b \text{ Negative Immediate Income Effect} \end{array} \right.$

(2) $g_s > g_p$ $\left\{ \begin{array}{l} (2)_a \text{ Positive Immediate Income Effect} \\ (2)_b \text{ Negative Immediate Income Effect} \end{array} \right.$

(3) $g_s < g_p$ $\left\{ \begin{array}{l} (3)_a \text{ Positive Immediate Income Effect} \\ (3)_b \text{ Negative Immediate Income Effect} \end{array} \right.$

Graphically, these six situations are described in Figure 1 on pages 21 and 22.

E_g , the income effect, is added to or subtracted from the current level of earnings of the parent company to arrive at the adjusted earnings per share after the combination. The magnitude of the income effect can be calculated using the following formula:

$$E_g = \frac{\begin{array}{l} \text{Current combined} \\ \text{earnings of parent} \\ \text{and subsidiary's common} - \\ \text{stock in total} \end{array} \quad \begin{array}{l} \text{Total earnings of} \\ \text{parent and subsidiary} \\ \text{calculated at earnings} \\ \text{per share rate of parent} \\ \text{company prior to} \\ \text{acquisition} \end{array}}{\begin{array}{l} \text{Total number of shares of} \\ \text{common stock after combination} \end{array}}$$

$$E_g = \frac{(T_{es}) (Z) + (Y) (E_p) - (Y + Z) (E_p)}{(Y + Z)}$$

Simplifying

$$E_g = \frac{Z (T_{es} - E_p)}{Y + Z}$$

For income effect to be positive, T_{es} must be greater than E_p .

Equations for Growth Trends of Earnings Per Share

The general equations for the future earnings per share of the subsidiary, the parent company, and their combined

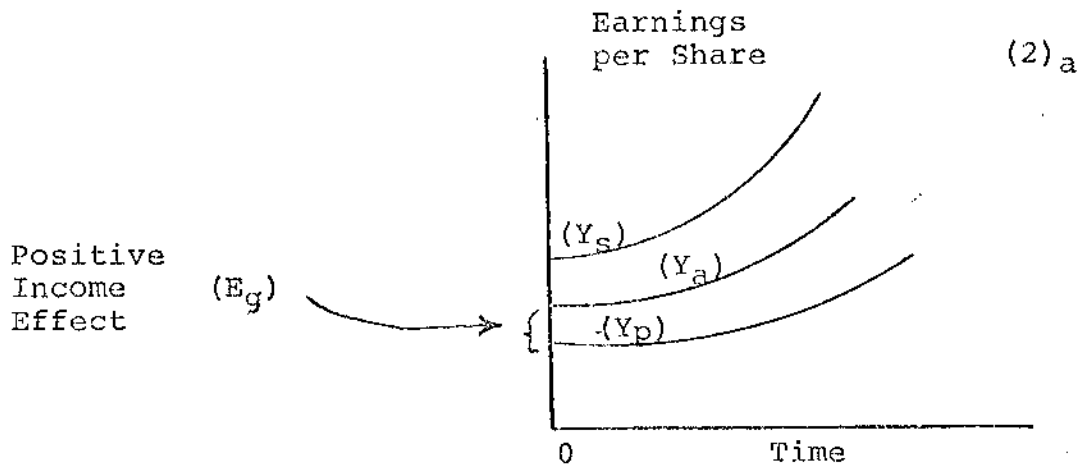
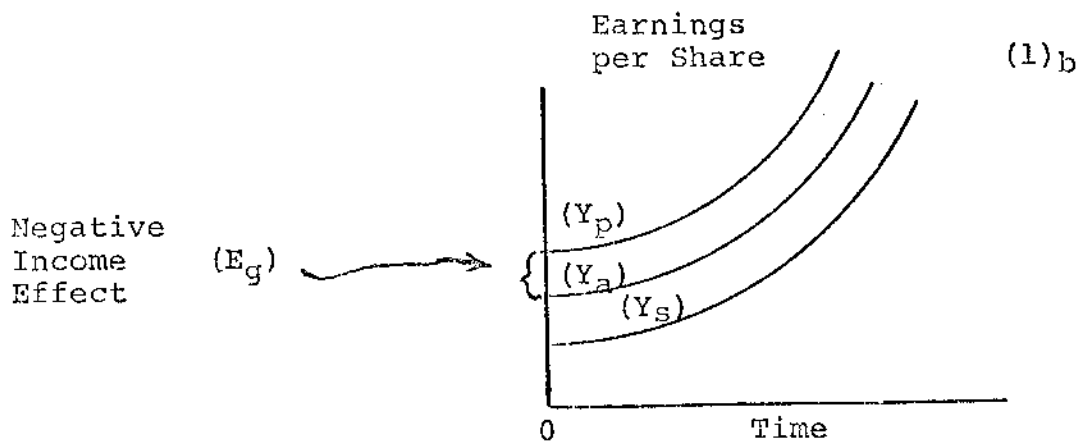
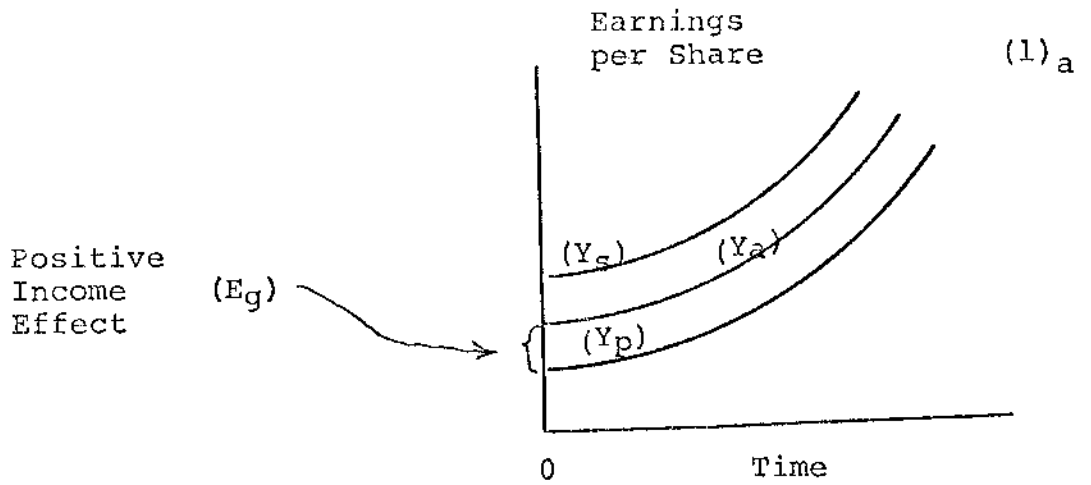


Fig. 1--Possible trends in income per share resulting from acquisitions.

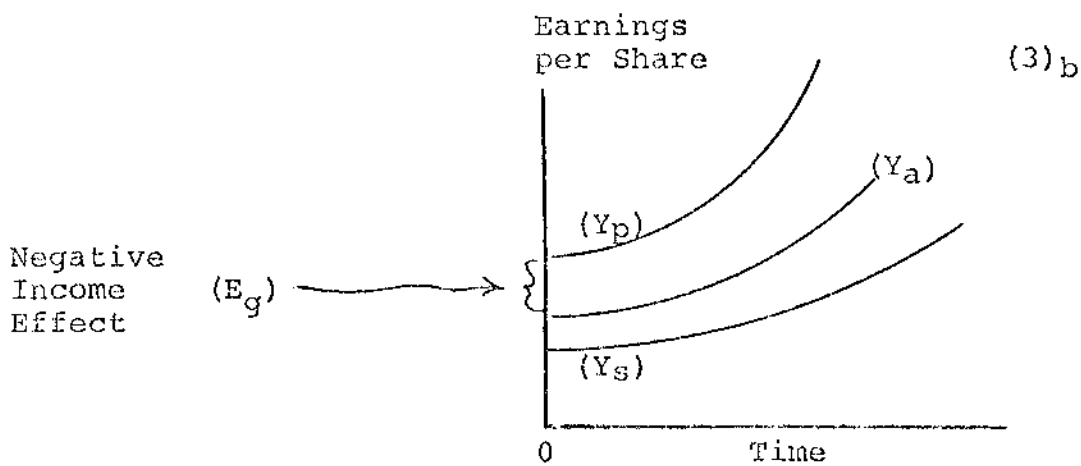
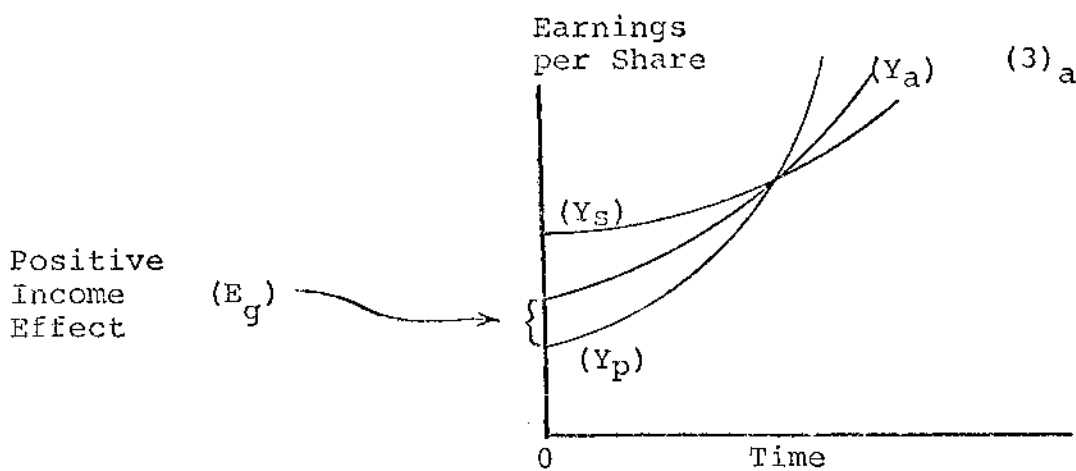
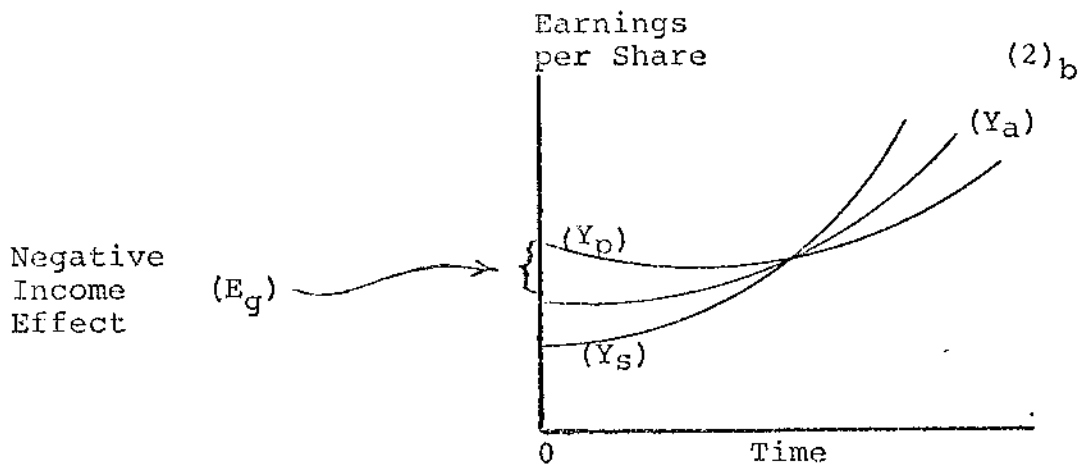


Fig. 1--Continued

earnings per share are given in the following three equations respectively.

$$(1) \quad Y_s = T_{es} (1 + g_s)^t$$

$$(2) \quad Y_p = E_p (1 + g_p)^t$$

$$(3) \quad Y_a = \frac{T_{es} (1 + g_s)^t Z + E_p (1 + g_p)^t Y}{Y + Z}$$

To check equation (3) we know that when t equals zero, the correct value for Y_a is E_p plus or minus E_g . Accordingly, when t equals zero,

$$Y_a = \frac{(T_{es}) (Z) + (E_p) (Y)}{Y + Z}$$

Simultaneously adding and subtracting $(Z) (E_p)$ in the numerator of the above equation causes it to assume the following form:

$$Y_a = \frac{(T_{es}) (Z) - (Z) (E_p) + (Z) (E_p) + (E_p) (Y)}{Y + Z}$$

Writing the equation in two parts and simplifying,

$$Y_a = \frac{Z (T_{es} - E_p)}{Y + Z} + \frac{E_p (Z + Y)}{Y + Z}$$

The equation then simplifies to

$$Y_a = E_g + E_p \quad (\text{when } t \text{ equals zero})$$

Time until Break Even

Under certain circumstances (such as situation 2_b, described in the diagrams previously presented) the parent company will accept a negative income effect with the expectation that the higher growth rate of the acquired company's resources will more than justify the initial dilution in earnings per share, or possibly (as in situation 3_a) a company will be attracted by the favorable income effect and assume that the initial increase in earnings per share will more than justify the loss in earnings per share at some future date. In any case, the time until the income effect is offset by growth is an important parameter. It is calculated in the following manner:

Break even occurs where $Y_s = Y_p$ or, alternatively, where $\log Y_s = \log Y_p$. Since

$$Y_s = T_e s (1 + g_s)^t$$

and

$$Y_p = E_p (1 + g_p)^t$$

also

$$\log Y_s = t \log (1 + g_s) + \log T_e s$$

and

$$\log Y_p = t \log (1 + g_p) + \log E_p$$

therefore, at breakeven

$$t \log (1 + g_s) + \log T_e s = t \log (1 + g_p) + \log E_p$$

solving for t

$$t = \frac{\log E_p - \log T_{es}}{\log (1 + g_s) - \log (1 + g_p)}$$

Note that in the preceding equation for t , the only independent variable subject to control is T_{es} , the transposed earnings per share of the acquired company. Since

$$T_{es} = \frac{W}{Z} (E_s)$$

Where

W . . . refers to the number of common shares outstanding in the subsidiary company before acquisition

Z . . . as before, refers to the number of shares of the parent company traded for the shares of the subsidiary

E_s . . . refers to current earnings per share of the subsidiary before acquisition and measured in terms of its own shares

Accordingly, T_{es} can be controlled by adjusting the ratio of Z to W . By doing this, the time to break even can also be shortened or extended. In fact, the appropriate exchange ratio could be established on this basis if one arbitrarily adopted some minimum time until break even.

In a broader context, it might be possible to say that g_s and E_s are variables subject to control. This is true in the sense that one might not agree to acquire companies unless their current earnings per share and their growth rates were above some given level. If this were the case, then one wishing to minimize the time until break even (2_b) would try to maximize the ratio of g_s to g_p and minimize the

ratio of E_p to T_{es} . On the other hand, if one wished to maximize the length of time until break even, then an attempt would be made to minimize the ratio of g_s to g_p and to maximize the ratio of E_p to T_{es} .

Effects of Multiple Acquisitions

All of the preceding equations express relationships which apply to a single acquisition. The growth trend of earnings of a conglomerate company with only one subsidiary was denoted by the following equation:

$$Y_a = \frac{[T_{es} (1 + g_s)^t Z] + [E_p (1 + g_p)^t Y]}{[Y] + [Z]}$$

If there were more than one acquisition, the total earnings could be represented by an equation of the same form but with an additional term in both numerator and denominator for each of the additional subsidiaries.

The growth trend of a conglomerate is actually the weighted average of the growth trends of the individual subsidiaries. The reason that a conglomerate company can sometimes give the impression of growth when growth does not exist is that sometimes it is able to acquire subsidiaries which contribute more to current earnings than the overall growth rate takes away. Such a policy of acquisition by a parent company becomes progressively more difficult to pursue in a successful manner because the weighted-average growth rate continues to become more and more negative as companies

are added. Since the rate of return in any time period is the weighted average of all components, larger and larger companies must be acquired in order to offset the effects of the real decline in productivity. Beyond some point the company is unable to acquire companies of the magnitude required.

Earnings Patterns under Conditions
of Multiple Acquisitions

Assume that a parent company has current earnings per share of E_p and a growth rate g_p . Also let this company acquire each year, on the average, a subsidiary whose transposed earnings per share are T_{es} and a growth rate in earnings per share of g_s .

$$Y_p = E_p (1 + g_p)^t Y$$

and

$$Y_s = T_{es} (1 + g_s)^t Z$$

Letting Y_t denote total income per share, then

When $t = 0$

$$Y_t = Y_p = \frac{E_p \cdot Y}{Y}$$

When $t = 1$

$$Y_1 = \frac{E_p (1 + g_p)^1 \cdot Y + T_{es} \cdot Z}{Y + Z}$$

When $t = 2$

$$Y_2 = \frac{E_p (1 + g_p)^2 \cdot Y + T_{es} \cdot Z + T_{es} (1 + g_s)^1 \cdot Z}{Y + 2Z}$$

When $t = 3$

$$Y_3 = \frac{E_p(1+g_p)^3 \cdot Y + T_{es} \cdot Z + T_{es}(1+g_s)^1 \cdot Z + T_{es}(1+g_s)^2 \cdot Z}{Y + 3Z}$$

or, in general terms:

$$Y_t = \frac{E_p(1+g_p)^t \cdot Y}{Y + tZ} + \frac{\sum_{k=0}^{k=t-1} T_{es}(1+g_s)^k \cdot Z}{Y + tZ}$$

The relationship expressed in the above equation, when graphed as a function of time, will take on different shapes, depending upon the values assigned to E_p , T_{es} , g_p , and g_s . Generally, if g_p and g_s are both positive and T_{es} is greater than E_p , the curve will have a continuously positive slope as t increases. If, on the other hand, T_{es} is greater than E_p but g_s and g_p are negative, the curve will have a positive slope only so long as acquisition income is greater than the decrease in income per share from the negative growth rates. Depending upon precise values for the variables, the curves will appear similar to one of the following if acquisition income is positive but overall growth rates are negative.

The curve could have the shape shown in Figure 3 because of the possibility that the parent company might have a very high declining growth rate (percentage-wise) and, therefore, higher dollar losses in income in the earlier years than in

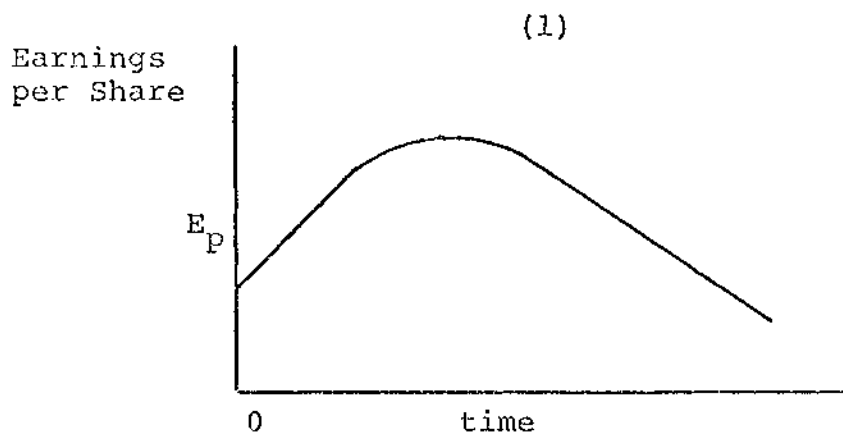


Fig. 2--Long-run trends in earnings per share if operating trends are negative and acquisition income is positive.

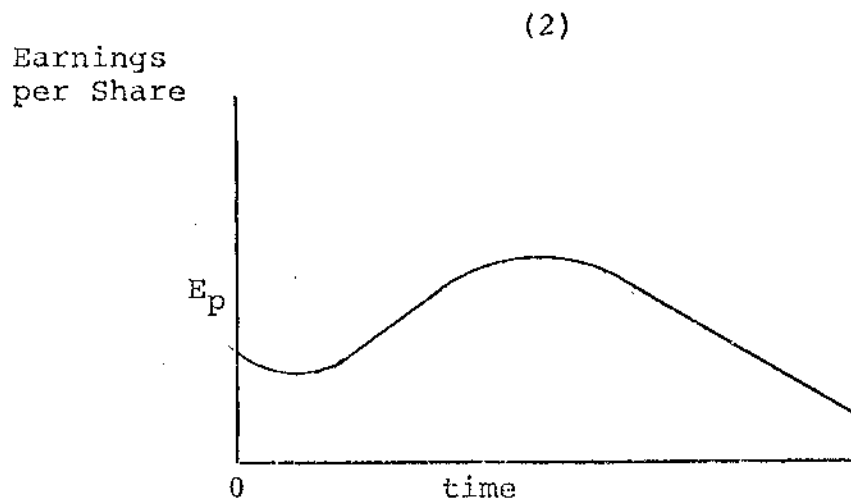


Fig. 3--Long-run trends in earnings per share if operating trends are negative and acquisition income is positive with initial dilution in earnings per share.

subsequent years. Under these conditions the initial losses in income by the parent company could be greater than the gains in acquisition income, but, as these losses decreased in dollar terms, it would be possible for acquisition income to cause total income per share to increase for a time period.

Finally, as less and less income is derived (percentage-wise) through acquisition, the overall declining growth rate will once again cause earnings per share to decline absolutely.

Under conditions in which the growth rate of parent company and subsidiaries are both positive, but acquisition income is negative, curves similar to the ones above would be appropriate except the curves would be inverted. That is, when T_{es} is less than E_p but g_p and g_s are positive, the following growth patterns are possible.

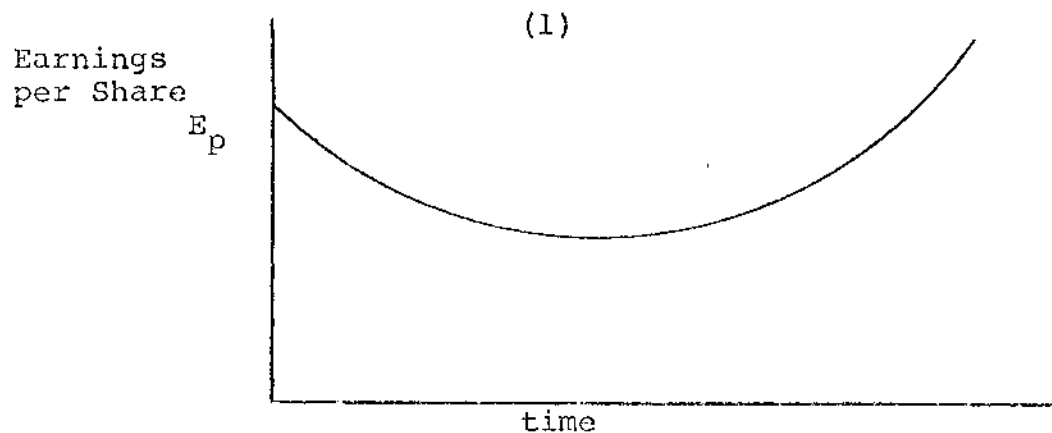


Fig. 4--Long-run trends in earnings per share if operating trends are positive and acquisition income is negative.

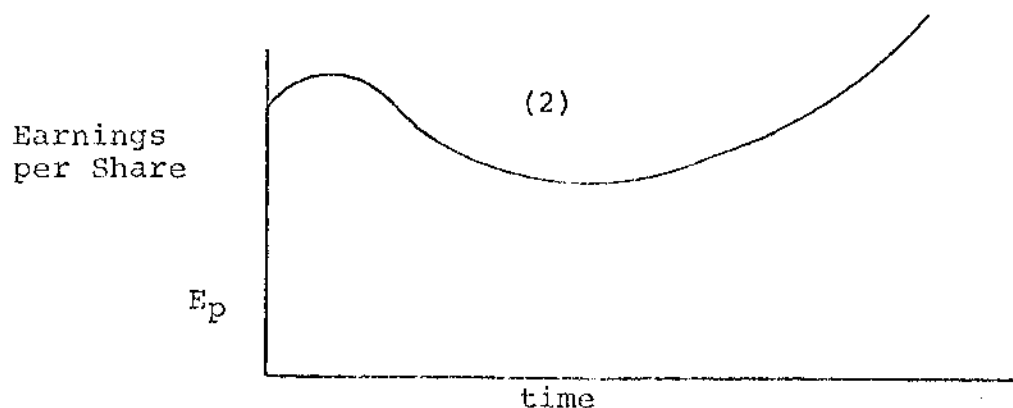


Fig. 5--Long-run trends in earnings per share if operating trends are positive and acquisition income is negative with initial increase in earnings per share.

Figure 4 depicts a situation in which acquisition income dilutes earnings per share until such time that the growth in operating income per share exceeds the dilution. In Figure 5, growth in operating income per share is initially a larger absolute amount than the dilution in earnings per share experienced through acquisitions. Accordingly, earnings per share increase until dilution from acquisitions exceed the growth in operating earnings per share. Thereafter, the pattern is the same as that shown in Figure 4.

It can be shown that as long as g_s and g_p are negative, the value for the expression

$$Y_t = \frac{E_p(1+g_p)^t \cdot Y}{Y + tZ} + \frac{\sum_{k=0}^{t-1} T_{es}(1+g_s)^{k \cdot Z}}{Y + tZ}$$

Income from
Parent
Income from
Subsidiaries

converges as t increases. That is, it can be shown that the eventual downward slope of the line depicted in Figures 2 and 3 is correct. Accordingly, acquisition income alone cannot be used to sustain growth indefinitely under such conditions.

It is fairly obvious that the contribution of the parent company to total earnings approaches zero as time increases and so long as g_p is assumed to be negative. However, it is not as obvious in the case of the income provided by the subsidiary companies. The denominator of the fraction

expressing the income contribution of the subsidiaries becomes progressively larger as t increases; accordingly, if the numerator converges, the entire expression converges.

The series

$$\sum_{k=0}^{k=t-1} T_{es} (1+g_s)^k \cdot z$$

is a geometric series of the form

$$S_n = a + ar + ar^1 + ar^2 \dots \dots ar^{n-1}$$

where

$$a = T_{es} \cdot z \quad \text{and} \quad r = (1+g_s)$$

Since this is a geometric series, the absolute value of r determines whether or not the series converges. If the absolute value of r is greater than one, the series diverges; if it is less than one, the series converges. Since it was assumed that g_s is negative, it follows that the value for r is negative, the series converges, and the value of the total function decreases as time increases.

CHAPTER III

ADDITIONAL BACKGROUND MATERIAL, MOTIVES, AND POSSIBLE EFFICIENCIES UNDERLYING THE GROWTH OF CONGLOMERATE COMPANIES

Perhaps the tone of this paper has been unduly harsh regarding the motives underlying the rapid growth of conglomerate companies--implying that the attainment of acquisition is the only possible motive. In fact, neither the motives nor the circumstances surrounding conglomerates are simple, nor are they necessarily the same in all cases. The study and analysis of conglomerates is complicated by the following factors:

1. No unanimity of purpose on the part of those forming conglomerate companies
2. No generally accepted definition of what constitutes a conglomerate company
3. The preoccupation of government agencies and the courts with maintaining competition
4. The possibility that efficiencies in operation are derived through conglomerate mergers
5. The lumping together of operating and acquisition income
6. The absence of established earnings trends for

conglomerate companies which include periods of adverse business conditions

7. The availability of financial data for conglomerates only on a consolidated basis

8. Lack of uniformity of accounting methods between companies

9. Lack of comparability of circumstances before and after merger

10. From the viewpoint of an investor, the lack of a theory of value for placing a value on the shares of conglomerate companies in light of the forementioned difficulties and in light of the uniqueness of conglomerate companies.

The obstacles confronting anyone who purports to draw generalizations about conglomerate companies are exceeded in magnitude only by the need of such generalizations. While no study can solve all the forementioned difficulties, it is possible to circumvent enough of them so that the investor can base his decisions on the "present value" criterion. At least this is the main objective of this paper--to provide a way for investors to value conglomerate companies. The study does not claim to solve all the issues from an economic point of view.

In remaining chapters, attention is devoted to all ten of the problem areas listed above. In the following section of this chapter, there is a discussion of the attitude of the courts and public-policy maker, a discussion of possible

efficiencies underlying the conglomerate-type mergers, a discussion of some of the more obvious motives of those responsible for the formation of conglomerate companies, and, finally, a definition of conglomerate mergers. The other issues are treated in subsequent chapters.

The Attitude of the Supreme Court and
Regulatory Agencies toward
Conglomerate Companies

Because the long-run survival of conglomerate companies rests on their legal sanction, it is impossible, or at least illogical, to ignore the attitude of the courts and public-policy makers. Thus, the following is a brief explanation of the apparent attitude of these parties.

The growth of conglomerate mergers has created some unique problems in the formulation of public policy. The Federal Trade Commission and the Antitrust Division of the Justice Department share the responsibility for approving and regulating mergers; however, in contested cases the Supreme Court is the final authority. Accordingly, these agencies tend to look toward the courts for clarification.

Traditionally, the courts have applied specific criteria to determine whether or not a substantial reduction in competition has resulted from a particular merger (the criteria relate to the number of firms and share of market affected). Since past considerations have been largely limited to traditional forms of mergers, existing guidelines

are rather awkward when applied to conglomerate mergers. In the spring of 1968 Donald F. Turner, Assistant Attorney General who was in charge of the Antitrust Division, questioned his own position in moving against conglomerates, stating that these laws are "no panacea."¹ The Federal Trade Commission chairman has expressed a similar reluctance to go after conglomerates, stating that he needs the majority of the support of the four other commissioners.²

The courts have been placed in a rather strained position since they must apply laws and guidelines not really designed for application to conglomerate-type companies.

(With conglomerate mergers the number of competitors remains the same, and no actual change in marketing structure occurs, initially.) The Supreme Court, in its decision to require Procter and Gamble to divest itself of Clorox, extended the concept of "relevant market" to include potential as well as actual competition.³ That is, the court held that Procter and Gamble was a potential entrant into the bleach market because it was a natural extension of their existing product lines. The court called this a "product extensions" merger.⁴

¹"Measuring the Surge of Mergers," Business Week, No. 2013 (March 23, 1968), p. 69.

²Ibid.

³James M. and D. Jeanne Patterson, "Conglomerates: The Legal Issues," Business Horizons, XI (February, 1968), p. 42.

⁴Ibid., p. 43.

In a Circuit Court ruling in the General Foods-S.O.S. decision, Judge Austin L. Staley extended the concept of "relevant competition" even further when he stated that

The commission could reasonably conclude that the potential competition was adversely affected by General Foods' entrance into the market through the acquisition of S.O.S. because the entry of such a large, well financed, aggressive competitor would necessarily hamper whatever effect potential competition had in the pre-merger market.⁵

Apparently, the guidelines being followed by the courts regarding conglomerate mergers relate to the nearness of the merger to either a horizontal or vertical merger--i.e., a product extension merger--or else to the size and power of the company involved. The position of the Justice Department was somewhat clarified on May 31, 1968, with the publication of a set of merger guidelines which listed the ones likely to be challenged. Specifically, the guidelines state that the following types of mergers will continue to be challenged:

Those so-called horizontal mergers involving direct competitors, where in highly concentrated markets the acquiring company and the acquired concern each account for as little as 4% of their market.

"Vertical" mergers involving suppliers and their customers such as a shoe manufacturer and shoe retailers, where the supplier accounts for 10% or more of total market sales and the customer accounts for 6% or more of total market purchases.

And "conglomerate" mergers, defined as those that are neither horizontal or vertical, where a

⁵Ibid., p. 42.

very large company that might have entered a new business through internal expansion instead enters by acquiring an important concern already in the business; where the merger creates dangers of reciprocal buying, and where the acquiring company's promotional resources are so great as to enhance an acquired company's existing dominance in its field.⁶

The guidelines just presented might imply that the Justice Department has moved against conglomerate mergers as well as other forms; however, this is not the case, as the following indicates:

The Clayton Act since 1950, has been used by the Justice Department and the FTC to stop almost all proposed horizontal mergers, and the stringent guidelines concerning such mergers are taken directly from these cases. The act has been similarly used against vertical mergers and, as a result, very few corporate merger proposals nowadays are of either type. The great majority of mergers are the conglomerate type. The FTC reported recently that 83% of all "large" mergers in 1967 were conglomerates.⁷

The guidelines which have been promulgated and the recent court decisions suggest that the legality of a particular conglomerate merger will be determined on a rather selective basis. This view is shared by James M. and D. Jeanne Patterson, who believe that future court decisions will be based on actual recognition of the motive or motives underlying the merger but will be stated in terms of traditional arguments.⁸

⁶"Justice Agency Issues Merger Guide," The Wall Street Journal, CLXXI (May 31, 1968), p. 4.

⁷Ibid.

⁸Patterson, op. cit., p. 43.

In any case, the future of conglomerate mergers is clouded. The existing laws are apparently founded on the premise that the maintenance of "competition" will best serve the interests of society, and it is possible, as many writers point out, that the use of this older concept may be inappropriate in an environment characterized by modern technology, human capital, and countervailing power. Perhaps the current status of the law is best summed up in the following quotation:

The language of the Clayton Act leaves most of the burden of deciding the issue of conglomerate size up to the courts. It is of course unwise, and probably impossible, not to leave the Supreme Court considerable discretion in such matters if the legislation is to be durable and effective. Still, by its nature the Court is bound to follow the course of its own evolving logic. When it encounters a new situation, it searches among past approaches for appropriate solutions. In the case of the conglomerate merger, the Court has chosen to deal with the problem by extending the traditional structural tests (number of firms and market share) that it developed for vertical and horizontal mergers via the rubric of potential competition. It is not at all clear that such a test can be anything but arbitrarily applied to pure conglomerates. Even more important, it is not clear that the structural test should be applied to the conglomerate case.⁹

Possible Efficiencies Released in Mergers

Logic demands that the attention of both investors and public-policy makers be directed toward possible efficiencies released in mergers. "Synergy" in financial jargon has come

⁹Ibid., pp. 47-48.

to mean efficiency released through merger. The release of synergy is the most desirable outcome of a merger since all interests can be served if this occurs. That is, with the release of synergy it is possible for management and stockholders to benefit through increased profits while society's resources are being employed more efficiently.

In theory, for synergy potential to exist, the companies being combined must have similar or complementary needs in areas such as management, financing, production, technology, and distribution. Management synergy can be thought of as the increment of efficiency which results from bringing together the separate firms under a single management. Likewise, synergy release in the areas of finance, production, technology, and distribution can be viewed as the change in overall efficiency which results in these functional areas when the units forming the conglomerate are brought together. It is, of course, not possible to measure synergy.

There is general agreement that the potential for synergy exists in many mergers; however, releasing it is another matter. In the words of one executive, "Don't think it's hard to release synergy; it's not. It's damn near impossible."¹⁰ Almost every survey encountered emphasizes the importance of management in releasing synergy. The following quotation is indicative of such emphasis.

¹⁰John Kitching, "Why Do Mergers Miscarry?" Harvard Business Review, XLV (November-December, 1967), p. 94.

The element critical for success is not the potential amount of synergy to be released in combining two companies. Rather, it is the existence or absence of managers of change--men who can catalyze the combination process. In the most successful mergers, either the acquiring company brought in new managers of change or it motivated the old management to introduce profitable changes.¹¹

Perhaps the most extensive study done to date regarding synergy was the one conducted by John Kitching, who investigated the experiences of companies two to seven years following acquisitions. Twenty-two companies were included in the study, and some rather interesting results were obtained. The acquisitions of the twenty-two companies were analyzed and classified in the following manner:

Horizontal--Same industry as buying company, with approximately the same customers and suppliers.

Vertical integration--Major supplier or customer of the buying company and in the same industry.

Concentric marketing--Same customer types as buying company but different technology.

Concentric technology--Same technology as buying company but different customer types.

Conglomerate--Customers and technology different from those of the buying company.¹²

¹¹Ibid., pp. 85 and 91.

¹²Ibid., p. 85; Note: The above definitions are not standard ones--the definitions to be used in this paper are presented in a subsequent section.

Due to the nature of synergy, the only quantitative data which can be formulated is that which is based upon qualitative opinions. Accordingly, John Kitching asked the executives of the various companies interviewed to rate the degree of synergy attainable in various functions and for different types of mergers. The following table contains part of the results of this survey:

TABLE III
SYNERGY POTENTIAL

Type of Merger	Finance	Marketing	Technology	Production
Conglomerate	100	58	20	32
Concentric Technology	100	72	72	27
Concentric Marketing	100	100	57	72
Horizontal	96	100	41	29
All Categories	100	74	33	36

Source: John Kitching, "Why Do Mergers Miscarry?" Harvard Business Review, XLV (November-December, 1967), p. 93.

Executives scored the dollar payoff of synergy as "high," "medium," "low," or "none" for each acquisition case. The scores were converted into arbitrary units, with 100 representing the score for the highest-rated function. Thus, the table shows relative payoff values for each function.

According to the total ordinal values assigned to each type of merger in Table III, the synergy potential is least in the case of conglomerate-type mergers. Also, the ordinal rankings of synergy potential for the functional areas are, in this order, finance, marketing, technology, and production--a ranking which seems to contradict common sense. According to John Kitching, synergy potential would ostensibly be highest in the case of production, since efficiencies of scale, quantity discounts, and more efficient machinery would appear to offer very substantial opportunities for efficiencies.¹³ Also, technology would appear to be an area of high synergy potential because of possible sharing of expensive R & D results and technological processes. The sharing of marketing facilities, organizational efficiencies, and financing abilities would logically rank toward the bottom of the scale in terms of synergy potential. As the chart shows, the reverse of this order was suggested by the executives interviewed.

A possible explanation for the high ranking of financial synergy and marketing synergy is that, in these areas, synergy is easiest to release. For example, greater borrowing potential of the parent company or excess cash flow could enable the newly acquired firm to immediately undertake profitable projects which they were unable to

¹³Ibid., p. 92.

finance by themselves. Also, it is suggested that the relative ease of training a sales force to sell a new product would make marketing synergies relatively easy to release.

The same executives whose responses are tabulated in Table III were asked to rank the various categories of synergy potential in terms of ease of release. Table IV on page 45 is a summary of the results of their opinions.

According to results tabulated in Table IV, synergy release is the lowest for conglomerates in all categories except finance. That is, relative to other types of mergers, the release of marketing efficiencies, technology efficiencies, and production efficiencies is harder in the case of conglomerates.

To conclude, synergy potential and the release of synergy appears to be highest in the case of mergers which combine financing and marketing functions. It is possible, however, that these are the areas in which synergy release is attained most rapidly and therefore most obviously. In the long-run, it may be possible that production and technology synergies play a significant but less immediate role. Overriding both the long-run and short-run considerations, however, is the apparent need for "managers of change" (or management synergy) to release synergy potential in the various functional areas.

While the results of Kitching's survey are highly qualitative and impossible to prove, if they are valid, then

TABLE IV
SYNERGY RELEASE

Type of Merger	Finance	Marketing	Technology	Production
Conglomerate	100	42	18	24
Concentric Technology	65	75	100	65
Concentric Marketing	100	74	21	47
Horizontal	100	67	33	24
All Categories	100	59	33	34

Source: John Kitching, "Why Do Mergers Miscarry?" Harvard Business Review, XLV (November-December, 1967), p. 93.

Scores are tabulated as noted for Table III.

the current antitrust trend toward favoring "pure"¹⁴ conglomerates may be the least desirable alternative from an efficiency point of view. In such mergers the only functional area of synergy potential is in the financial area. Such a conclusion, however, assumes that there is no validity to the public-policy maker's desires to "maintain competition."

Definition of a Conglomerate Merger

A factor which complicates valid inferences about conglomerates is the lack of unanimity of definition. A

¹⁴A definition of "pure" conglomerates is in the following section of the text.

conglomerate merger deemed a product extension merger may involve companies with similar customers, similar technologies, and similar production processes. Thus, a conglomerate merger may be pure or mixed, depending upon the degree of synergy potential in various functional areas.

For discussion purposes, in this paper conglomerate mergers are classified according to synergy potential as

1. Pure conglomerate merger--one in which no substantial potential exists for sharing production, technology, and marketing functions.

2. Mixed conglomerate merger--one in which some combination of potential exists for substantial sharing of production, technology, and marketing functions but not enough so that the merger could be considered a vertical, horizontal, or circular one.

Possible Motives of Stockholders and Management Leading to the Growth of Conglomerate Companies

The objectives and interests of stockholders and management do not necessarily coincide. Furthermore, it is never possible to determine unequivocally the motive or motives underlying the behavior of individuals or groups of individuals. Accordingly, the following discussion of motives and interests is intended only to suggest some of the more obvious possibilities.

The motives of the stockholders of both the acquired company and acquiring company must generally be satisfied before a merger can be consummated. The stockholders of the company being acquired may receive cash, securities, or some form of property settlement in exchange for their securities. It is also possible that they could receive some package of the forenamed types of payment. In all cases, for the transaction to be rational, a majority of both groups of stockholders must believe that they are receiving more in terms of current values than they are giving up.

As the supply of attractive merger candidates continues to decline in the face of increased demand, the bargaining position of the acquired companies will also improve. Accordingly, at some point in time, the motives of the stockholders of the acquired companies may become at least a moderate constraint on merger activity.

The following quotation illustrates one of the possible ways for a parent company's management to satisfy the desires of the stockholders of both the acquired and acquiring company:

The purchase of another company has been based as a rule, on an exchange of securities designed to yield tidy benefits to all parties concerned, without much cost in cash to the acquiring company.

Usually, the stockholders of the company acquired are given preferred stock, which they are expected to exchange at some future date for the common stock of the conglomerate if the market value of the stock increases. The preferred,

meanwhile, is to pay them a dividend substantially larger than the dividend that they have been getting on the stock of the acquired company.

This preferred dividend, generous as it is, still takes only a portion of the profits the acquired company has been earning. That leaves the balance of its profits to be added to the profits on the common stock of the conglomerate, thus helping it to report a rise in earnings.¹⁵

In instances where the stockholders rely heavily on market performance rather than on fundamental values based on income potential, the outcome is not always as favorable as the preceding example might imply. Consider the transaction described below.

Borrow several million dollars, using stock in a subsidiary firm as collateral. Buy another company, merge it into the subsidiary and sell additional shares of that subsidiary to the public. You can then pay off the loan while retaining majority control of both the subsidiary and the new firm. Do you recognize the strategy? Of course, it's the merger game--and that is only one of the possible moves.¹⁶

In a transaction such as the one just described, it is possible that the motives of the stockholders of the parent company will be promoted at the expense of the naive stockholder who has bought the new shares in the subsidiary company. If, however, the market continues to support the price of the subsidiary company's stock, even the

¹⁵"'Glamour Stocks' That Ran into Trouble," U.S. News & World Report, LXIV (March 18, 1968), p. 113.

¹⁶James M. and D. Jeanne Patterson, "Conglomerates: The Legal Issues," Business Horizons, XI (February, 1968), p. 42.

performance-oriented stockholder may benefit from the transaction.

Except in those cases in which management is motivated by public welfare or power and prestige, their motives can be expected to coincide rather closely with those of the shareholders of the company which they manage. That is, any action by management which is directed toward increased profits, increased market price of the stock, or increased stability of earnings could be expected to further the interests of both groups.

In earlier sections of this thesis it has been suggested that the attainment of acquisition income may be one of the dominant motives underlying the growth of conglomerates. The possibility that profits may be increased because of the release of synergy has also been suggested as a possible motive. There is still a third class of motives, which might be called institutional motives. That is, motives which are intended to promote overall profits or stability but are not dependent upon acquisition income or the release of synergy could be referred to as institutional motives. An example of such an acquisition is one in which a company is acquired for its loss carry forward.

In many mergers, more than one class of motive may be present. The following is a listing of motives which are primarily institutional in nature but with synergy implied in several instances:

1. Obtain new products. Industrial annals are full of examples of small companies that became big through acquisitions of a new product or material. When synthetic fibers were perfected, for example, there followed a wave of mergers of companies which had never been in the textile or related business with companies which had mastered the application of these new fibers.

2. Offset declining markets. Innumerable producers of steam locomotive parts and components were in the market for new company acquisitions when the diesel locomotive outmoded steam. A more recent example is the urgent efforts of cigarette companies to get into other fields just in case the anti-smoking campaign is successful.

3. Stimulate growth. In this era of economic expansion, it's a rare company that is satisfied to stand still. It sees in mergers a technique for keeping in step with the nation's growth. Thus a maker of hand tools (hammers, saws, screw drivers, etc.) may not be content with a market that is only mildly expansive. It may well try to acquire a power tool subsidiary as a means of cashing in on the homemakers' love affair with make-it-yourself.

4. Stabilize seasonal and cyclical trends. In the old days, the coal dealer bought up the local ice dealer to insure summer and winter business. Today, a more likely example is the refrigerator maker who takes on a line of space heaters and humidifiers to assure all-year-round demand for what he makes.

5. Put excess working capital to work. This is a common and understandable reason for many mergers. Idle capital can be better utilized in investment in a new firm than gathering dust in a bank.

6. Convert a holding company to an operating company. Tax considerations often stimulate a private holding company to convert into an operating firm. The most painless way to do it is to buy up an existing and going operation.¹⁷

¹⁷Johan Bjorksten, "Merger Lemons," Acquisitions and Mergers, I (Fall, 1965), p. 37.

The following diagram is perhaps appropriate for summarizing the range of possible motives underlying the growth of conglomerate mergers:

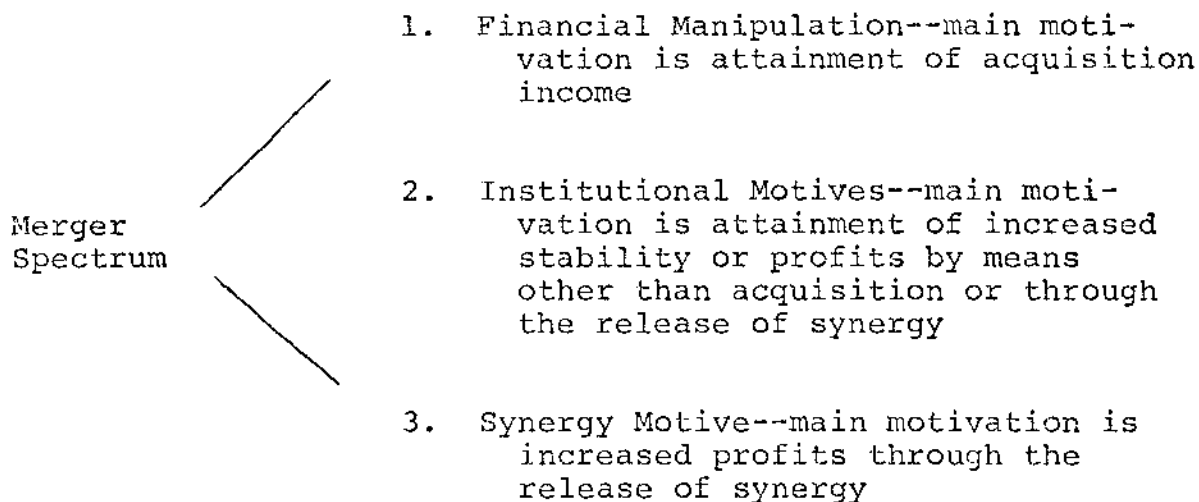


Fig. 6--Merger Spectrum

Moving down the merger spectrum from one to three, the degree of desirability probably increases from the viewpoint of both investors and public-policy makers. In particular, it would be desirable to isolate those companies which rely solely on financial manipulation at the expense of efficiency. Unfortunately, existing theories of value and methods of analysis are inadequate for making such a distinction.

CHAPTER IV

THEORIES OF VALUE AND THEIR IMPLEMENTATION

In the last chapter it was pointed out that a range of possible objectives and efficiencies may underlie the growth of companies engaged in conglomerate mergers. Unfortunately, investors do not have appropriate methods for placing values on the shares of these companies relative to their income potential for the following reasons:

1. The lumping together of operating and acquisition income in financial reports,
2. The absence of established earnings trends under various economic conditions,
3. The data regarding financial performance are generally provided only on a consolidated basis,
4. The lack of uniformity in accounting methods between companies and before and after merger,
5. The lack of comparability of operating circumstances before and after merger,
6. The presence of diversification of earnings due to multi-industry orientation.

Since the factors listed above preclude the application of traditional methods of valuation, a new method and new approach are imperative. In pursuit of this objective, the

first part of this chapter is concerned with theories of value in general and the various alternative theories which are possible. An effort is made to show that theories of value are not theories in a scientific sense, but rather that they are decision models which have objectives and assumptions implicit in them. Finally, in the latter part of this chapter, a theory for valuing the stock of conglomerate companies is developed which gives recognition to problem areas two and six listed above.

The chapters which follow this one are concerned with the remaining problem areas and the testing of some hypotheses which relate directly to the application of the theory to a selected group of conglomerates. Also, the final development and refinement of the theory of value in question is consummated.

Theories of Value

When a quantification is sought for a characteristic such as investment value or speculative value, the quantification is attained through valuation processes rather than measurement processes. Characteristics such as investment value and speculative value cannot be measured because they are subjective characteristics which exist only in the minds of those placing the values, and, accordingly, an element of choice exists regarding the method in which numerical values are assigned.

Stockholders have historically exerted their choice prerogative in the theories of value and valuation criteria which they have applied. In his recent article in the Financial Analysts Journal, "Performance--the Latest Name for Speculation?", David Babson described the evolution in appraisal emphasis as historically moving through the following states:

1. Net worth, book value and physical assets
- to
2. Income return, dividends and yield
- to
3. Earnings and earnings reliability
- to
4. Long-range growth rate of earnings
- and now to
5. Instant earnings growth.¹

The last appraisal method mentioned above is an obvious reference to stockholders who are motivated to buy shares in conglomerate companies because of the ability of such companies to show instant increases in income through acquisition. Perhaps it should be pointed out, in fairness to investors, that their reliance on instant earnings growth may be a by-product of their inability to discern long-run income potential.² Also, it is perhaps important to note that the range of possible valuation criteria is not limited to five or six, but is virtually unlimited.

¹Abraham J. Briloff, "Distortions Arising from Pooling-of-Interests Accounting," Financial Analysts Journal, XXIV (March-April, 1968), p. 75.

²John M. Keynes, The General Theory (New York, 1935), p. 148.

Investment and Speculative Theories of Value

While the actual number of motives and theories of value which could be applied in security purchases are nearly unlimited, there are only three formalized approaches. The three approaches referred to are those of the fundamentalists, the technicians, and the random-walk theorists.³

Fundamentalists attempt to define a type of intrinsic value for particular securities based upon long-run economic expectations, whereas random-walk theorists and technicians attempt to make projections of market prices. By either making assumptions about what creates future income or what causes market prices to change, the three approaches are used to develop guides to investment or speculative decision making.

There is a tendency to treat the three schools of thought as being totally unrelated. This tendency has caused a certain amount of rigidity and intolerance among advocates of the different point of view. In reality, all three approaches are characterized by decision models whose real differences can be attributed to differing objectives and differing assumptions.

³For discussion of fundamentalists' approach to valuation see Benjamin Graham and others, Security Analysis (New York, 1962); for differentiation between fundamental and technical approach to security valuation see John C. Clendenin and George A. Christy, Introduction to Investments, 5th edition (New York, 1969), p. 254.

The following section in this chapter demonstrates that theories of value are equivalent to decision models, and also a detailed examination is made of the elements of decision-making situations. This is done in an effort to create the proper background for developing a theory of value which is applicable to conglomerate companies.

Decision Models

It is possible to state, in a somewhat unrewarding manner, that an investor having a certain amount of funds available for investment will rationally divide his funds among alternative investments in such a way that

$$\frac{\text{Expected benefits from the purchase of one more share of Company X}}{\text{Price of shares in Company X}} = \frac{\text{Expected benefits from the purchase of one more share of Company Y}}{\text{Price of shares in Company Y}} = \frac{\text{Expected benefits from the purchase of one more share of the last alternative company}}{\text{Price of shares in last company}}$$

In other words, it is possible to state that a rational investor will seek to spread his investment funds among alternative outlets in such a way that the total utility per dollar invested is a maximum.

In order for a particular investor to approximate the equality expressed above, methods must exist which are acceptable for placing values on the alternative investments. Stated differently, investors are decision makers who are in a position of having to select the most desirable alternatives available in light of their own objectives and needs. To

select the most desirable alternative, the investor in question should have a clear understanding of his own objectives and the circumstances surrounding the investment (i.e., a clear understanding of the decision-making situation).

Decision-Making Situations

In order for a decision-making situation to arise there must exist (1) a decision maker with an objective or problem, (2) a certain number of factors related to the objective or problem which are not within the control of the decision maker, and (3) a certain number of alternatives of action. Without all three of these elements, a decision-making situation cannot exist. For discussion purposes those factors which are not within the control of the decision maker are referred to as states of the world.

While it is not always obvious, a relationship exists between the problem or objective of the decision maker and the particular state of the world surrounding the decision. The truth of this proposition can be readily visualized if one observes that the state of the world surrounding the decision is responsible for the problem or objective faced by the decision maker. In other words, if there were not resistance in the form of environmental circumstances, then problems or objectives would not exist. The decision maker faced with a set of circumstances attempts to take an action which will lead to a different state of the world.

Hopefully, this subsequent state of the world will correspond to the one corresponding with preconceived objectives.

The elements of a decision-making situation are perhaps best visualized in matrix form. Possible states of the world are typically listed in columns, and alternatives listed in rows. In the following matrix the Y's denote possible states of the world, the X's refer to possible alternatives of action (alternative investment outlets), and the A's refer to the expected outcomes of the various alternatives, given the corresponding states of the world.

	Y ₁	Y ₂	Y ₃	Y ₄	Y ₅
X ₁	A ₁₁	A ₁₂	A ₁₃	A ₁₄	A ₁₅
X ₂	A ₂₁	A ₂₂	A ₂₃	A ₂₄	A ₂₅
X ₃	A ₃₁	A ₃₂	A ₃₃	A ₃₄	A ₃₅
X ₄	A ₄₁	A ₄₂	A ₄₃	A ₄₄	A ₄₅
X ₅	A ₅₁	A ₅₂	A ₅₃	A ₅₄	A ₅₅

Fig. 7--Decision matrix under conditions of future uncertainty.

In the above matrix, five possible states of the world are represented, along with five possible alternatives of action (alternative investments). In theory, the number of rows and columns could be expected to include as many

alternatives and states of the world as are considered possible. The A's are a measure of the expected outcomes of the various alternatives, given a specific objective and values for states of the world. Accordingly, the A's can be considered an ordinal measure of the value of an alternative, given a specific state of the world and an objective.

In order to fill in values for the A's in the payoff matrix, a relationship must be derived between alternatives, states of the world, and an objective variable "O." (The nature of this relationship will be explained more fully in the following paragraph.) In mathematical terms, the A variable is the dependent variable, and the O and Y variables are the independent ones. Accordingly, the relationship between values for alternatives, objectives, and states of the world can be expressed as

$$A = f(O, Y)$$

Under conditions of certainty (assumed certainty) about states of the world surrounding the decision, it is not necessary to describe the decision-making situation in matrix form. The desired values for the objective variable and values for states of the world can be substituted directly into the decision model, and a corresponding value for A is determined for each alternative under consideration. Under conditions of certainty the resultant values for A are adequate for decision-making purposes. That is, the ordinal

rankings which result for the A's allow the most desirable alternative to be selected.

The theories of value followed by fundamentalists are decision models of the above form. That is, the appropriate numerical valuation for a security is determined by (1) specifying an objective in numerical terms, (2) deriving numerical values for the state of the world under conditions of assumed certainty, and (3) solving the decision model (i.e., theory of value) for the corresponding value of A, the alternative of action. Thus, under these conditions, the appropriate valuation for the security is also the appropriate numerical value for the alternative of action under the conditions prescribed.

The basic valuation model of the fundamentalists is the one which prescribes the present value of future dividends, given a desired rate of return and a projection of future dividends. The model is usually expressed in this form:

$$P = \sum_{t=1}^{t=k} \frac{D (1 + G)^t}{(1 + R)^t}$$

In the above model D is the current dividend rate, G is the percentage growth rate of dividends, t is time, R is the rate at which the future dividends are discounted, P is the present value of the future dividends, and k is the length of time for which dividends are to be received. Note that D, G, and t are environmental circumstances, P is the value

for the alternative of action, and R is the objective variable. By prescribing values for the states of the world and also for the objective variable, the corresponding value of P is also determined.

While some of the models used by fundamentalists are more elaborate than the one presented above, all of them follow the same form. That is, they all have environmental circumstances and an objective variable as independent variables. Also, the dependent variable is always the numerical valuation for the security being valued, which is also a numerical valuation for an alternative of action.

Thus, to summarize, it can be shown that so-called theories of intrinsic value are nothing more than decision models whose dependent variable is the derived numerical valuation for the security. Also, it can be shown that such decision models generally assume conditions of certainty about the state of the world. A legitimate question to be asked at this point is--Why have theories of intrinsic value been limited to such simplified assumptions about the nature of environmental circumstances? The next section in this chapter discusses and presents the different possible decision-making situations in terms of the manner in which the states of the world are assumed to be generated. Accordingly, if such a classification scheme is all-inclusive, then all possible methods of valuing securities will also be enumerated.

Types of Decision-Making Situations

According to the foregoing analysis, in order for a decision-making situation to have any meaning, the decision maker must have some preconceived notion about the proper response he should make whenever the state of the world assumes a particular configuration. Assuming that the reaction of the decision maker in response to his environment is carefully conceived (i.e., derived under the assumptions of appropriate objectives, and by making valid assumptions about the relationship between alternatives, states of the world, and objectives), then the major problem faced by the decision maker is determining values for the variables that describe the state of the world.

Decision-making situations can be classified according to what is known about the state of the world. In many instances the assumption is made that the state of the world is known with certainty. This is always an assumption, however, because perfect knowledge is never possible. In many instances the state of the world can be identified with sufficient accuracy to warrant its being considered as certain. Probably the most common reason for lack of reasonable certainty is that decisions must be made before the relevant state of the world materializes. For example, in financing, production, and marketing decisions, one of the major variables describing the state of the world is the demand for the goods which are being financed and

produced. Since the demand will not be known until a future date, estimates must be made beforehand.

Another type of uncertainty can exist in a decision-making situation because of physical or financial limitations of the decision maker to perceive existing facts about the state of the world. If, for example, a decision maker needed to know the average age of the citizens in a particular community at a particular point in time, both physical and financial constraints could prohibit such a measurement. It is significant that the age of people at a particular point in time is a fact. Also, such facts are indicative of a state of the world which has already materialized, and the uncertainty which exists is fundamentally different from the type previously described.

For discussion purposes, the first type of uncertainty described above is referred to as "future" uncertainty, and the latter type is referred to as "knowledge" uncertainty. To reiterate briefly, future uncertainty exists because the state of the world has not materialized at the time the decision must be made, and furthermore the forces acting upon the environment are not adequately understood so that accurate predictions can be made about the future. The second type, or knowledge uncertainty, exists because of the decision maker's inability to attain a valuation for state of the world variables which exist at the time the decision is to be made. Thus, decision-making situations can be

broadly classified as those under certainty and those under uncertainty. Within the "uncertainty" category two additional subcategories are discernible. The following diagram is intended to be indicative of these broad divisions.

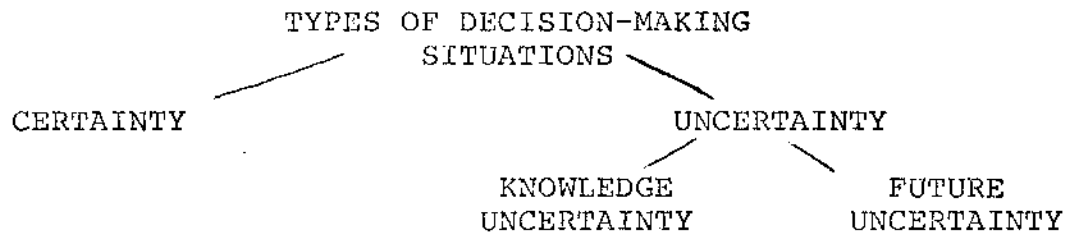


Fig. 8--General types of decision-making situations

Within the category of future uncertainty there are several additional subcategories of decision-making situations. These two subcategories are defined on the basis of the nature of the process generating the states of the world, as either consistent or inconsistent processes. If a consistent process is generating the states of the world then, at least in terms of probability, there is order to the decision environment. If, however, there is an inconsistent process generating the states of the world, then no probabilistic order other than subjective probabilities can be assigned to the generation of the states of the world. The completed decision diagram is shown on page 65.

Figure 9 is helpful in identifying different decision-making situations. As previously noted, the diagram is based upon the assumption that decision-making situations can be meaningfully classified according to the nature of

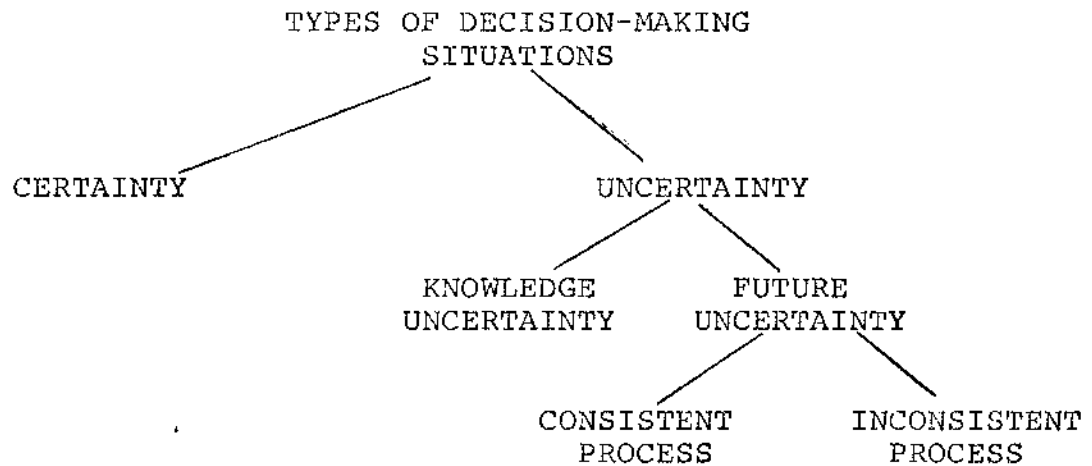


Fig. 9--Specific types of decision-making situations

the process generating the independent variables (*i.e.*, environmental circumstances) of the decision model. Also, the same format is quite useful for classifying various types of mathematical techniques which exist for solving the corresponding decision-making situation for the desirable alternative. The diagram presented in Figure 10 represents such a classification scheme.

To summarize, it can be demonstrated that the theories of investment value used by fundamentalists are really nothing more than decision models of the form described in this chapter. Since this is true, it is logical to suggest that such theories have been limited to rather simplified assumptions about how the relevant states of the world are being generated. Also, it appears likely that fundamentalists have not availed themselves of some of the more sophisticated techniques used for solving decision-making situations.

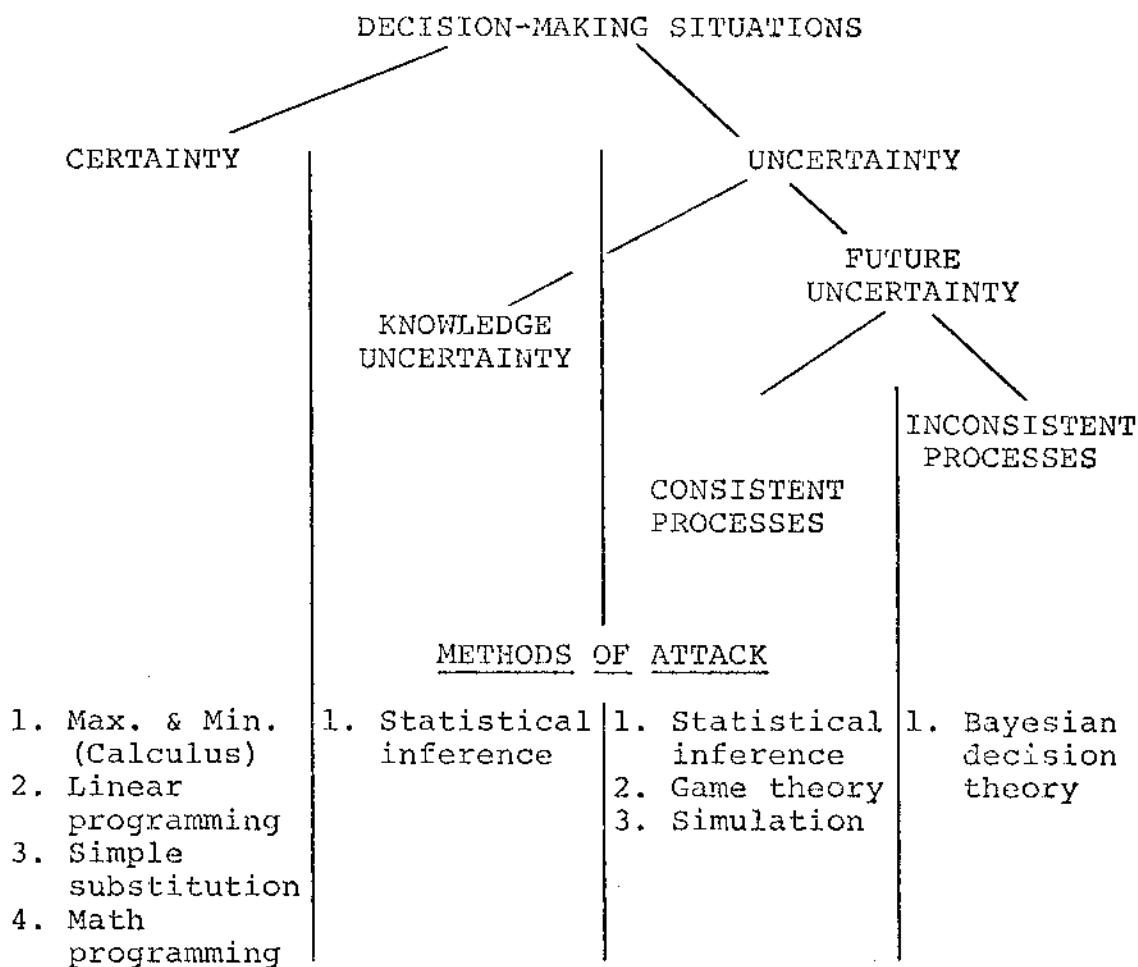


Fig. 10--Types of decision-making situations and methods of attack.

The selection of the most appropriate method for making investment decisions (i.e., the selection of a theory of value) depends largely on whether or not proper recognition is given to the method in which the relevant states of the world are being generated. The following section of this chapter discusses the assumptions underlying current approaches to investment decisions and suggests why such assumptions may not be appropriate for valuing investment alternatives involving conglomerate companies.

Generation of the Relevant States of the World

According to the format developed in the previous section, four different patterns exist in which numerical values for states of the world can be generated. These four patterns are (1) complete certainty, (2) knowledge uncertainty, (3) future uncertainty with a consistent process generating the values, and (4) future uncertainty with an inconsistent process generating values for the independent variables.

In the first of the categories listed above, it is assumed that the values exist at the time the decision is to be made, and, furthermore, such valuations are assumed to be known with certainty. In the second instance, the relevant state of the world exists but for one or more reasons is difficult or impossible to ascertain. In the third type of situation, the relevant state of the world has not been generated but can be anticipated with some degree of reliability because of order in the underlying process. An example of this type of process would be a production process which produces acceptable and unacceptable products in accordance with a Bernoulli process.⁴ Finally, in the latter category, are events which have not yet occurred and to which no dependable order exists in their materialization.

⁴For explanation and analysis of Bernoulli processes, see pp. 29-32 of Quantitative Analysis for Business Decisions, by Harold Bierman and others (Homewood, Illinois, 1965).

What then is the nature of the force or forces which generate values for theories of value used by fundamentalists? If such forces are inconsistent, then perhaps the assumption of certainty is not justified.

Basic Models Used by Fundamentalists

Underlying most valuation models currently in use is the concept of rate of return on investment. Depending upon the particular purpose, writers may emphasize either earnings per share or dividends per share; also, allowances for growth, inflation, and risk can be incorporated into the individual models. Theories based on the concept of current yield generally assume a form similar to the following:

$$\text{Rate of Return} \quad = \quad \frac{\text{Earnings per}}{\text{Period}} \\ \text{per Period} \quad \quad \quad \text{Investment}$$

$$i = \frac{E}{P}$$

The relationship expressed in the preceding equation is a truism when applied to variables of past experience. When applied in this manner the values for the variables are known with reasonable certainty. However, as a theory of value a standard $\frac{P}{E}$ ratio is assumed--depending upon the rate of return desired ($\frac{1}{I} = \frac{P}{E}$). When used as a theory of value, the investment value is determined by the product of the standard multiple times expected earnings. Used in this manner, E is

a future environmental circumstance and is derived under conditions of future uncertainty. Furthermore, there is little evidence to suggest that orderly or consistent forces are responsible for producing consequent values for E.

A slightly more complicated model can be derived by extending the concept of rate of return on investment to include more than one time period. Starting with the same basic equation,

$$i = \frac{E}{P} = \frac{S - P}{P}$$

and letting S denote total investment value at the end of a time period while P refers to the beginning principal, the equation can be rewritten this way:

$$S = P (1 + i)$$

When extended to more than one time period (i.e., to n time periods), the equation assumes the following form:

$$S = P (1 + i)^n$$

Once again, when the equation is applied to known values for i, n, and P, no special difficulties arise; however, when used as the basis of a theory of value, P becomes the dependent variable, and S becomes one of the independent variables. Under these conditions S is valued under conditions of future uncertainty, and no evidence suggests that consistent processes are generating such values. When

solved for P, the above equation is the one underlying all "present value" theories of value.

It is possible to combine both current yield and yield to maturity concepts into one theory of value. This is done by almost all writers who desire to develop methods for valuing common stocks. One such writer is Malkiel, who set forth the following model in The American Economic Review, for December, 1963.⁵

$$P = \frac{D(1+g)}{(1+r)} + \frac{D(1+g)^2}{(1+r)^2} + \frac{D(1+g)^n}{(1+r)^n} + \frac{MsE(1+g)^n}{(1+r)^n}$$

Where

D = Current dividends in dollars

Ms = Standard earnings multiplier S & P averages

g = Growth rate of company as a percent per year

E = Current earnings in dollars

r = Standard rate of growth S & P averages or the apparent marginal efficiency of the representative standard share

n = Number of years forecasted

P = Present value of future stream of receipts.

Malkiel's model makes provision for growth and for value of the stock in the n'th year. The last term of the model is based upon a current yield concept in the form of a standard $\frac{P}{E}$ multiple which is discounted, along with all

⁵Paul F. Wendt, "Current Growth Stock Valuation Methods," Financial Analysts Journal, XXI (March-April, 1965), p. 91, citing B. G. Malkiel, The American Economic Review (December, 1963).

preceding dividends, to a present value. The implementation of this model, like the simpler ones mentioned previously, requires that projections of future states of the world be made.

While a number of other forms of models exist besides the ones previously presented, they all are based upon the same present value notion, and all require the projection of future earnings or future dividends in their implementation. Furthermore, as noted previously, there is no evidence to support the belief that future earnings or future dividends are being generated, in all cases, by a consistent process.

J. M. Keynes was probably among the first to point out the difficulties inherent in any attempt to make long-range projections of fundamental economic behavior.

Our knowledge of the factors which will govern the yield of an investment some years hence is usually very slight and often negligible. If we speak frankly, we have to admit that our basis of knowledge for estimating the yield ten years hence of a railway, a copper mine, a textile factory, the good will of a patent medicine, an Atlantic liner, a building in the City of London amounts to little and sometimes to nothing; or even five years hence.⁶

In a subsequent passage, Keynes comments about the effects of future uncertainty on the valuation processes or theories of value.

It might have been supposed that competition between expert professionals, possessing judgment and knowledge beyond that of the average private

⁶John M. Keynes, The General Theory (New York, 1964), p. 149.

investor, would correct the vagaries of the ignorant individual left to himself . . . most of these persons are, in fact, largely concerned, not with making superior long-term forecasts of the probable yield of an investment over its whole life, but with foreseeing changes in the conventional basis of valuation a short time ahead of the general public.⁷

This battle of wits to anticipate the basis of conventional valuation a few months hence, rather than the prospective yield of an investment over a long term of years, does not even require gulls amongst the public to feed the maws of the professional;--it can be played by professionals amongst themselves. Nor is it necessary that anyone should keep his simple faith in the conventional basis of valuation having any genuine long-term validity. For it is, so to speak, a game of Snap, of Old Maid, of Musical Chairs--a pastime in which he is victor who says Snap neither too soon nor too late, who passes the Old Maid to his neighbour before the game is over, who secures a chair for himself when the music stops. These games can be played with zest and enjoyment, though all the players know that it is the Old Maid which is circulating, or that when the music stops some of the players will find themselves unseated.⁸

In this latter paragraph, Keynes suggests that the Technical approach to security valuation is a natural corollary to the existence of a market characterized by future uncertainty.

In a decision-making context, it is possible to state that Fundamentalists and Technicians have theories of value which are based upon slightly different objectives and different assumptions about the related states of the world.

⁷Ibid., p. 150.

⁸Ibid.

Fundamentalists attempt to find a security selling below its investment value, whereas Technicians, or Chartists, attempt to find securities whose price will rise in the near future. The theories of value used by Technicians appear most frequently in the form of charts or graphs--the basic assumption seems to be that patterns exist in the way that average opinion places values on securities, and by being familiar with such patterns, one can anticipate price changes.

Conflicting Theories of Value

The objective underlying Technical theories of value is to anticipate price changes, and the alternative dictated by such theories is to buy or sell the security, depending upon the direction of expected price changes. Generically speaking, this type of objective and method of selecting an alternative is quite different from the corresponding ones used by Fundamentalists.

In addition to differing objectives, one of the main differences between the theories of value used by Technicians and those of Fundamentalists is that Technicians' models have existing states of the world as independent variables rather than future states, as is true in the case of Fundamentalists. Thus, the models used by Technicians avoid the problem of future uncertainty by assuming that a consistent process generates price movements, and by assuming that if one has knowledge of the pattern, then all one has to do is plug

in the relevant state of the world today in order to predict tomorrow's prices.

In all fairness to both the Fundamentalists and Technicians, spokesmen for both schools generally admit that their conclusions and forecasts are subject to some doubt, and in the case of the majority of Fundamentalists, a provision is usually made for an appropriate margin of safety or for diversification. However, the basic approaches of both schools remain tantamount to ignoring the possibility that an investment in a single security is a commitment to the future which, in turn, may be subject to largely imperfect or unknown forces.

In light of the conflicts and controversies between the views of the Fundamentalists and those of the Technicians, it is not surprising that studies have been conducted whose conclusions support the random-walk thesis. The best-known of such studies is probably the one done by Eugene Fama.⁹ The conclusions of this study seem to imply that both the Fundamentalists and the Technicians are unable to determine information or theories of value which will allow decisions to be made that yield profits greater than could be attained by a naive buy-and-hold strategy.

Thus, at one extreme both the Fundamentalists and the Technicians argue that there is order to the generation of

⁹Eugene Fama, "Random Walks in Stock Market Prices," Financial Analysts Journal, XXI (Sept.-Oct., 1965), pp. 55-59.

future events, but they disagree as to the nature of the order. At the other extreme, proponents of the random-walk thesis argue that stock price movements are sufficiently random so that the average investor can do no better than a buy-and-hold strategy.

Thus, to summarize these three different points of view, the following diagram is used once more:

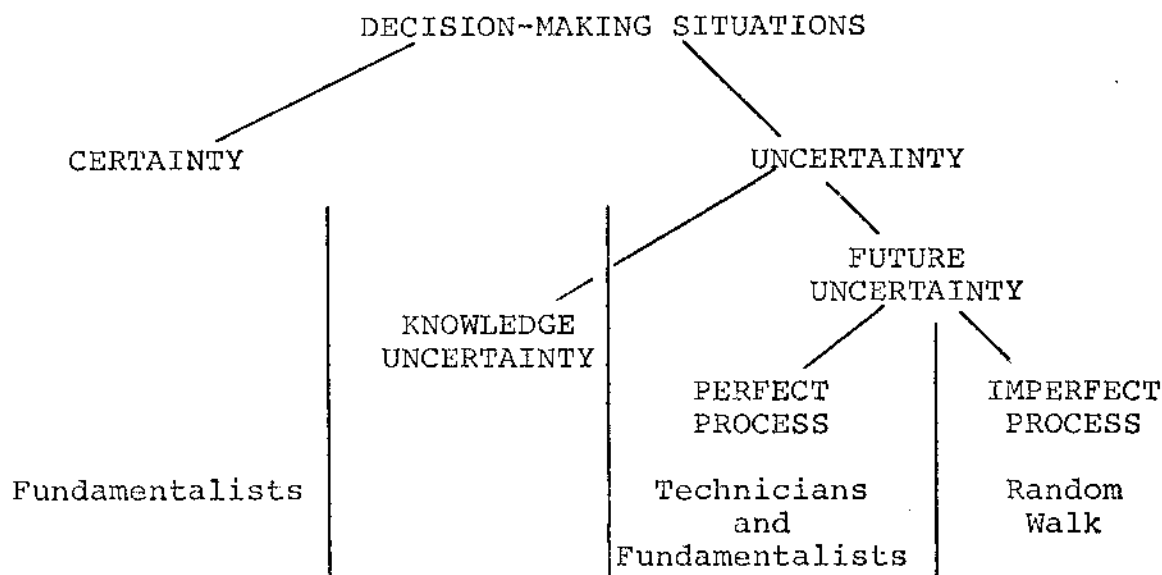


Fig. 11--Assumptions underlying the major approaches to security valuation.

Of course, the Fundamentalists have basic economic variables as independent variables, whereas Technicians have present price and volume movements. Thus, the order assumed by Technicians is not orderly generation of economic conditions, but rather, they assume order exists in the methods which individuals follow, on the average, when placing values

on securities. Finally, Random-walk theorists refuse to recognize dependable order in either instance.

The Decision Environment Surrounding Conglomerate Companies

One of the critical elements in selecting a theory of value is the assumption about how the states of the world are being generated. As noted in the previous section, most of the formalized theories which exist have avoided the problem of future uncertainty by either assuming certainty or by assuming that a perfectly consistent force is generating future events. Or, as in the case of Random-walk advocates, no dependable order is recognized at all.

Regarding the valuation of conglomerate companies, it may be a bit premature to ask if future uncertainty exists when the present valuation environment is clouded by the following factors:

1. The lumping together of operating and acquisition income in financial reports.
2. The absence of established earnings trends under various economic conditions.
3. The data regarding financial performance is generally provided only on a consolidated basis.
4. The lack of uniformity of accounting methods between companies before and after merger.
5. The lack of comparability of operating circumstances before and after merger.

6. The presence of diversification of earnings due to multi-industry orientation.

Because of all of the reasons listed above, but mainly because no earnings trends exist for conglomerate companies which include periods of adverse business conditions, the recognition of uncertainty seems to be an unavoidable consequence.

If uncertainty is recognized, then because the states of the world underlying the valuation of conglomerate companies (from the Fundamentalists' point of view) are future income levels, the particular type of uncertainty to be dealt with is future uncertainty. Furthermore, if valuation is to occur at all, there must exist some degree of order to the generation of the future states of the world--order in the sense of a probabilistic ordering). Accordingly, the states of the world applicable to the valuation of conglomerate companies would appear to be most appropriately considered as being subject to future uncertainty with something less than a perfect process generating values for the states of the world. Under conditions such as these, the diagram presented in Figure 10 suggests that by default the only logical choice of method for placing values on alternatives is with the techniques of Bayesian decision theory. In line with this reasoning, one of the more common strategies in Bayesian decision theory is selected as a basis for developing an appropriate theory of value. Before this is

done, however, problems which arise when uncertainty is given recognition are discussed in the following section.

Problems Introduced with the Recognition of Uncertainty

When emphasis is shifted from conditions of certainty about the states of the world to conditions of uncertainty, probabilities are given specific recognition in the theory of value. Accordingly, each alternative in a decision-making situation has an outcome--given a desired value for an objective variable and for states of the world--and a probability for that outcome. This means that not just one number but two numbers, both an outcome and a probability of that outcome, can be associated with each alternative for each state of the world that is considered to exist. The contrast between decision making under conditions of certainty and uncertainty is highlighted by the following two matrices.

<u>Certainty</u>		<u>Uncertainty</u>				
	Y_1		Pr_1	Pr_2	Pr_3	Pr_4
	Y_1		Y_1	Y_2	Y_3	Y_4
Alternative 1	A_1	Alternative 1	A_{11}	A_{12}	A_{13}	A_{14}
Alternative 2	A_2	Alternative 2	A_{21}	A_{22}	A_{23}	A_{24}
Alternative 3	A_3	Alternative 3	A_{31}	A_{32}	A_{33}	A_{34}
Alternative 4	A_4	Alternative 4	A_{41}	A_{42}	A_{43}	A_{44}
Alternative 5	A_5	Alternative 5	A_{51}	A_{52}	A_{53}	A_{54}

Fig. 12--Matrices reflecting the two major types of decision-making situations.

As the preceding matrices show, under conditions of uncertainty, the valuation for each alternative is dependent upon both conditional outcomes and probabilities. This means that before a final valuation can occur, the decision maker must know what his preferences are regarding combinations of conditional outcomes and probabilities. Thus, a theory of value must be developed which recognizes both of these elements.

Objectives Underlying the Valuation of Conglomerate Companies

In order to define a theory of value which is appropriate under conditions of uncertainty, one must first specify the objective upon which the theory is to rest. That is, a theory of value places values on alternatives relative to a given value for an objective variable.

It cannot be proved that one objective is better than another except relative to other objectives and other assumptions. Accordingly, the selection of an objective is a personal matter, and if issue is taken with the objective implicit in a theory of value, then the theory of value is not appropriate.

The arbitrary nature of the selection of an objective is evident in the manner in which John Burr Williams, the father of investment present-value theory, justified his selection:

This definition for investment value which we have chosen is in harmony with the time honored method of economic theory which always begins its investigations by asking, "What would men do if they were perfectly rational and self seeking?"¹⁰

Following the lead of Williams, as he appeals to common sense as authority for his theory, the objective which is assumed to underlie the rational purchase of common stock under conditions of future uncertainty is the maximization of expected present value per dollar invested. That is, it is assumed that a rational investor will always try to select the alternative investment having the highest probability-weighted average of present values--where probabilities and present values exist for each state of the world considered possible.

In a decision-making context, it is possible to state that a decision maker with the objective defined above will continue to buy shares in Company X only so long as the following ratio is higher for shares in that company than the same ratio calculated for shares in another company:

$$\frac{\text{Expected Present Value of Future Income}}{\text{Price of Shares in Company X}}$$

The initial intent of examining and specifying an objective for valuing common stock of conglomerate companies

¹⁰John Burr Williams, Theory of Investment Value (Cambridge, Massachusetts, 1938), pp. 5-6.

under conditions of future uncertainty was to develop a corresponding theory of value which would give recognition to both probabilities and conditional present values. Such a theory is implied by the objective just defined. However, before developing the theory further, several assumptions about utility which are implicit in the objective are examined.

Assumptions about Utility Implied by the Objective to Maximize Expected Present Value

By assuming that a rational investor attempts to maximize expected present value under conditions of future uncertainty, several assumptions have been implied regarding the rational investor's preferences for various expected outcomes and their related probabilities. To begin with, the objective variable is the one which transforms values for expected outcomes and probabilities into a valuation for the alternative under consideration. Accordingly, if the objective variable is defined and applied appropriately, the resultant values for alternatives should correspond precisely to the preferences of the individual applying the decision model. Since the value for "r," the expected rate of return, is considered to be a constant when applied in determining the expected present value, it follows that one assumption underlying such an objective is that the individual investor applying the model will have a constant objective, regardless of the patterns and amounts which are attributed to expected

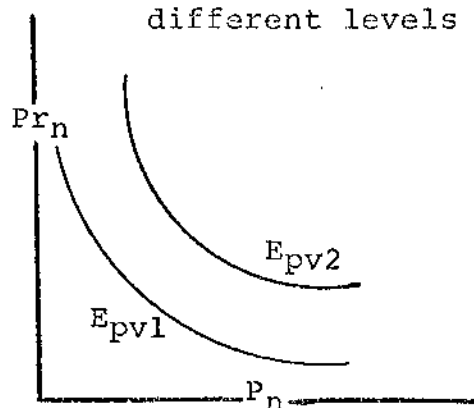
outcomes and their corresponding probabilities. This means that an investor is assumed to be indifferent as to the individual outcomes and probabilities which create a particular expected present value so long as the probability-weighted average of present values is the same. The graph below is indicative of this implied relationship.

E_{pv1} = a constant level of expected present value (since r is considered to be constant, this is also a constant level of utility)

E_{pv2} = a constant level of expected present value (utility), which is higher than E_{pv1}

Pr_n = the probability of state of the world "n," which corresponds to present value P_n

E_{pvm} = a constant level of expected present value "m," where m can take on values corresponding to different levels of indifference



$$E_{pvm} = Pr_n \cdot P_n$$

or

$$E_{pvm} = f(Pr_n \cdot P_n)$$

$$dE_{pvm} = \frac{\partial E_{pvm}}{\partial Pr_n} dPr_n + \frac{\partial E_{pvm}}{\partial P_n} dP_n$$

$$\frac{\partial E_{pvm}}{\partial Pr_n} = P_n \quad \text{and} \quad \frac{\partial E_{pvm}}{\partial P_n} = Pr_n$$

Fig. 13--Indifference curves reflecting constant expected present value.

Along a single indifference curve (E_{pv1} or E_{pv2} , for example) $dE_{pvm} = 0$. Thus

$$0 = (P_n) dPr_n + (Pr_n) dP_n$$

Dividing both sides of the equation by dP_n , the marginal rate of substitution is

$$\frac{dPr_n}{dP_n} = - \frac{Pr_n}{P_n}$$

The condition implied by the expression above is that in order for a constant level of utility to be maintained, a change in one variable must be off-set by a change in the opposite direction of the other. This is merely a mathematical formulation of the assumption noted previously that underlies the objective which has been defined.

A Theory of Value for Valuing the Stock of Conglomerates

Having defined the objective which is assumed to characterize the rational purchase of common stock under conditions of future uncertainty and having presented the assumptions about utility implied by the objective, the groundwork has been laid for developing the details of the theory of value desired.

Keeping in mind that the objective which has been assumed is the maximization of expected present value, the theory of value desired is perhaps best viewed as the method by which a single alternative in a decision-making situation is assigned a numerical value relative to this objective. A single alternative under conditions of uncertainty would

appear similar to the following:

$$\text{Alternative X} = \frac{\begin{matrix} \text{Pr}_1 & \text{Pr}_2 & \text{Pr}_3 & \dots & \text{Pr}_n \end{matrix}}{\begin{matrix} \text{P}_1 & \text{P}_2 & \text{P}_3 & \dots & \text{P}_n \end{matrix}}$$

In the matrix above, the present value for state of the world "n" is denoted by the following:

$$P_n = \sum_{t=1}^{t=s} \frac{E_t (1 + g_t)^t}{(1 + r)^t}$$

In the preceding equation, E_t is current earnings per share, g_t is the expected growth rate of earnings per share, t is time, s is number of time periods, and r is rate of return demanded per time period.

Expected present value is the theory of value which is used to value alternative X; it is the probability-weighted average of the present values under the various states of the world considered possible, where Pr_n is the probability of the state of the world n .

$$E_{pv} = P_1 \cdot \text{Pr}_1 + P_2 \cdot \text{Pr}_2 \dots P_n \cdot \text{Pr}_n$$

where

$$\text{Pr}_1 + \text{Pr}_2 \dots \text{Pr}_n = 1$$

or

$$E_{pv} = \sum_{n=1}^{n=m} \sum_{t=1}^{t=s} \frac{E_t (1 + g_{tn})^t}{(1 + r)^t} \cdot P_n$$

Alternative Valuation = $f \left[\begin{array}{l} \text{Objective} \\ \text{Variable} \end{array} \cdot \begin{array}{l} \text{States of} \\ \text{the World} \end{array} \text{ Probabilities of} \right. \\ \left. \begin{array}{l} \text{States of} \\ \text{the World} \end{array} \right]$

E_{pv} is the theory of value which is appropriate for placing values on various alternative investments under conditions of future uncertainty. Note that the main difference between the certainty model and the uncertainty model is that probabilities are now recognized as independent variables.

In the preceding equation, E_{pv} is expected present value, and g_{tn} is the expected growth rate in earnings per share if state of the world "n" occurs. Also, r is the expected rate of return.¹¹ In applying this theory of value, different states of the world considered possible would be evaluated to determine their likely effect on g_t , and a probability for each state of the world would be derived. Once g_t and Pr are determined for each state of the world, then an expected rate of return is specified by the investor. Given the current level of earnings per share E_t and the values for all of the other independent variables, then an expected present value can be derived.

For purposes of valuing the common stock of conglomerate companies, the assumption is made that the expected present value model is appropriate. The selection of this model is based on several considerations. First, the lack of experience of conglomerates under adverse business conditions

¹¹See page 86 for definition of r .

precludes the practice normally followed by Fundamentalists of projecting past earnings trends into the future. Accordingly, the recognition of uncertainty of future income is hardly avoidable. Second, present value theory is in conformity with the conservatism which should guide investment decisions. That is, in a financial atmosphere such as today's, the ability of an investor to place values on securities relative to income potential is extremely important unless the game of Snap is the real objective motivating stock purchases.¹² Finally, the expected present value criterion is conveniently applied to conglomerate companies' shares because it makes automatic adjustments for risk and for the effects of diversification of income sources. That is, by assuming different states of the world when applying the model, a decision maker builds into the calculation of expected present value the effects of risk and diversification on income. Accordingly, the value for "r" used in the theory of value is the rate of return demanded exclusive of the risk factor. This attribute of the model is due to the recognition of future uncertainty in the model itself.

While the final refinements of the theory proposed are contained in the last chapter, it seems fitting to present a simplified example of how the theory might be applied. For example, assume that five states of the world are possible

¹²Keynes, op. cit., p. 155.

(each characterized by a different g_t), and assume that the present value of the security being valued is calculated as \$95, \$106, \$75, \$65, and \$40 for each of the five states of the world considered possible. Furthermore, let it be assumed that the probability of state of the world number one (corresponding to the present value of \$95) is one-half, and the other four states of the world all have a probability of one-eighth. Under these conditions, the expected present value is

$$E_{pv} = (.5)(95) + (.125)(106) + (.125)(75) + (.125)(65) + (.125)(40)$$

or

$$E_{pv} = \$83.22$$

To summarize, the main intent of this chapter has been to point out the equality of theories of value and decision models used to place values on alternatives of action under various conditions of the decision environment. Once the equality was pointed out, it was suggested that the traditional assumptions of certainty and perfect processes are not justified in the valuation of the common stock of conglomerate companies. Finally, the basic framework of a theory of value was developed which recognized future uncertainty and made allowances for the effects of risk and diversification of income sources. The theory developed employed one of the simple decision strategies of Bayesian decision theory--namely, the strategy that an intelligent

investor or decision maker is assumed to use when attempting to maximize expected value.

CHAPTER V

BACKGROUND MATERIAL FOR ANALYSIS OF CONGLOMERATE COMPANIES

The following equation denotes E_{pv} , the expected present value. This is an expression of the theory of value which was defined as being appropriate for valuing the shares of conglomerate companies under conditions of future uncertainty.

$$E_{pv} = \sum_{n=1}^{n=m} \sum_{t=1}^{t=s} \frac{E_t (1 + g_{tn})^t}{(1 + r)^t} \cdot Pr_n$$

Under conditions of future uncertainty, an investor recognizes that on a given investment, the rate of return actually experienced may not correspond--and probably will not correspond--to the expected rate of return used in the valuation. In the long-run, however, if an investor with perfect expectations pays exactly the expected present value for all securities, then the real rate of return experienced will correspond to the expected rate of return.

The real rate of return experienced under conditions of perfect expectations would not likely correspond to the expected rate of return because the price paid for the securities would tend to be different from expected present

value. In a decision-making context, it is possible to state that an investor will attempt to buy shares at all times for which the following ratio is the highest:

$$\frac{\text{Expected Present Value}}{\text{Price Per Share}}$$

If the ratio above were equal to one for all investments made, then the long-run rate of return experienced under conditions of perfect expectations would be equal to the expected rate of return used in valuation. On the average, if the ratio were more than one, then the actual rate of return experienced would be more than the expected rate of return used in valuation.

Perfect Expectations

For perfect expectations to exist, the investor must have a perfect knowledge of the effects on g_t of different states of the world considered possible. Also, the probabilities of different states of the world would have to be known precisely.

It would, of course, be naive to assume that future states of the world could be predicted precisely, which is one of the reasons for the adoption of the expected present value model. Also, it is impossible to attach exact probabilities to different states of the world unless a

consistent process is generating future states of the world. On the other hand, unless reasonable order does exist to the generation of future states of the world and unless a reasonable expectation of the effects of different states of the world on g_t can be attained, then valuation is not possible. That is, for meaningful valuations to occur, facts, relationships, and probabilities based on past experience must be available which, though not necessarily perfect, are valid enough so that decisions can be made which are better than random ones. The hypotheses presented in Chapter I and reproduced below are intended to provide the basis for valuation of shares in conglomerate companies using the expected present value model.

Hypotheses

(1) Conglomerate companies listed on the New York and American stock exchanges acquiring the highest proportion of publicly owned subsidiaries in the period 1961-1967, have added negative value to them--where positive or negative value added is measured relative to the weighted average of the rates of return on book values of the resources employed by the subsidiary companies prior to their acquisition. Accordingly, negative value added is defined as the amount by which the projected rate of return on investment exceeds the rate actually experienced.

(2) The value added by conglomerate companies during the period 1961-1967 has tended to decrease from year to year as size and diversification have increased--where diversification is measured by the number of different industries in which resources are employed, and size is measured in terms of the book value of consolidated assets. (The decrease in value added can be from negative values to more-negative values or from positive values to less positive values.)

(3) Based on a projection of past acquisition policies, past weighted average growth trends of parent and subsidiary companies, and the same percentage of value added by parent company organizations--the current market prices of the common stocks of conglomerate companies are too high if an 8 percent discounted rate of return is demanded.

(4) If the conglomerate companies surveyed are grouped into (1) those adding the most value (relative to the other companies) and (2) those adding the least value, then the companies in each group will tend to have similar acquisition strategies. Acquisition strategies for this purpose are defined in terms of relative rates of return and growth rates of subsidiaries and parent companies at the time of acquisition.

Generally speaking, the belief underlying the presentation of all of the hypotheses is that conglomerate companies relying heavily on acquisitions have not added any additional

income potential to the subsidiaries that they acquire, but rather have devoted time and resources controlled by management to obtaining income through additional acquisitions rather than through the release of synergy of the companies acquired. That is, the hypotheses are intended to suggest that the motivation for such companies has not been as much to release synergy and create efficiencies as it has been to make immediate additions to earnings per share.

The dependent variable of the first two hypotheses, "value added," is only one factor contributing to income experienced during a particular time period. Specifically, "value added" is the efficiency of investment which can be attributed to the initial parent company, synergy release, and any unexpected increases in efficiency derived from acquisition. The exact definition of "value added" is elaborated more fully in the following sections of this chapter. For the time being, "value added" can be viewed as an efficiency variable which is largely controlled by the parent company.

Hypothesis number one, if it is correct, indicates that the effect on subsidiary growth potential of a company which follows a strategy of acquiring a relatively large number of publicly owned subsidiaries is, on the average, a negative effect. Hypothesis number two states that the rate at which value is added to subsidiary companies by a parent company decreases as size and diversification increase.

Since companies which concentrate on acquisitions generally are considered to depend upon a high P/E multiple relative to the multiple of the companies acquired, it follows that the subsidiary companies acquired may tend to have relatively lower growth rates compared to the parent. If such is the case, then it is likely that a slowing growth or even a declining growth can occur as decreases in operating growth become large, relative to growth derived from acquisitions.

The period 1961-1967 was chosen as the period for testing the hypotheses for several reasons; mainly, however, it was chosen because the broad economic circumstances in which operating and acquisition policies have been conceived and implemented have remained rather constant. By concentrating on this time period, the distortions in income which can arise from changes in external conditions will hopefully be minimized.

Problem Areas in Testing the Hypotheses

The hypotheses which were presented in the previous section are to be tested by reference to past operating performance during the 1960's. The conclusions derived from the hypotheses are not useful, directly, in the valuation of the shares of conglomerate companies because future and not past operating performance is the source of current value. However, in estimating future conditions, estimates must be

made relative to some starting point. The most fitting reference is assumed to be the immediate past. In fact, under conditions of future uncertainty, one state of the world which can be considered possible is a continuation of the immediate past.

In any event, before inferences can be made about the future, as clear an understanding of the present as possible is desirable. Unfortunately, the issues are clouded from an economic, or public policy, point of view as well as from the investor's point of view because of the problem areas mentioned before and reiterated again below:

1. The lumping together of operating and acquisition income.
2. The absence of established earnings trends under various economic conditions.
3. The data regarding financial performance is generally reported only on a consolidated basis.
4. Lack of uniformity of accounting methods between conglomerate companies and before and after merger of firms into a single conglomerate.
5. Lack of comparability of operating circumstances before and after merger.
6. The presence of diversification of earnings due to multi-industry orientation.

Recognition of all of the problem areas listed on this page should be made in one form or another in the development

and application of a theory of value. Such recognition may be manifested either in the theory of value itself, or in the methods in which the theory is implemented, or even as a limitation to the conclusions drawn. Hopefully, the limitations imposed by the problem areas can be minimized.

In the second chapter a method of implementing the present value theory was developed (i.e., the expected present value theory), which gave recognition to problem areas two and six. In this chapter, the effects of one and three are examined. Also, the following topics are covered as background material prior to testing the hypotheses:

- (1) External conditions which have facilitated the growth of conglomerate companies
- (2) Methods of external expansion
- (3) Pooling versus purchase accounting
- (4) Some hypothetical transactions.

External Conditions Which Have Facilitated the Growth of Conglomerate Companies

It was stated in an earlier section that the time period chosen for testing the hypotheses which were presented earlier was chosen because it was characterized by rather uniform external conditions. In the time period chosen, 1961-1967, the broad external economic conditions have been characterized by

- (1) General immunity of conglomerate companies to anti-trust actions

(2) Historically high prices in the stock market relative to "fundamental" values

(3) Sustained growth in GNP and other economic measures of national output

(4) Historically high inflation rate, particularly since 1965

(5) Historically high interest rates

Probably a few other factors could be added to the list above; however, they are the main ones which can be used to describe the period of gestation of most conglomerate companies. It follows from this that conglomerate companies are untested under other types of broad external economic conditions. In fact, it is possible that conglomerates have not yet been adequately tested by the conditions listed above.

The general immunity of "pure" conglomerates from anti-trust prosecution is one of the major factors which has contributed to the growth of financially motivated companies. That is, by concentrating on mergers which involve the combination of companies having similar functions and similar needs (e.g., Procter & Gamble and Clorox), the antitrust authorities have, to some degree, left the door open to pure conglomerates. That is, the door has been left open to mergers involving diverse firms in which the potential for synergy release is the least. The truth of the dominance of the conglomerate-type merger (where the term merger is used

generically to refer to all types of combinations) was indicated by the statistics published by the FTC and reproduced in the first chapter.

If the possible motives for mergers can be classified as financial, synergy release, and institutional,¹ and if synergy is ruled out by antitrust considerations (except for financial and managerial synergies), it follows that financial and institutional motives must account for the growth of conglomerate mergers. If these two factors are the main ones motivating the conglomerate merger surge, then society's resources are probably not being employed more efficiently in terms of pre- and post-acquisition status. Stated differently, unless synergy is being released in spite of these motives, then efficiencies are not being released by conglomerate mergers.

It is not necessarily obvious, of course, that the release of financial and managerial synergies, which are theoretically possible for conglomerates, is an insignificant factor in the conglomerate movement; however, it is also quite possible that the main motives are financial or institutional.

Historically high prices in the stock market coupled with investors' inability to place values on the shares of conglomerate companies relative to long-run income potential

¹See page 50 for a classification of motives underlying merger activity.

is also probably one of the major factors which has contributed to the growth of conglomerate mergers. Since shares in conglomerate companies tend to be glamour-type stocks, and for that reason are relatively more volatile than most others, periods of generally high prices are the periods in which acquisitions can be implemented on the most favorable terms. That is, in periods of high prices, fewer shares of the parent company must be given up to match the market value of the shares of the company being acquired. (The use of higher-priced shares to acquire those of another company is sometimes referred to as using "Chinese money.")

The historically high rate of inflation has probably added to the rising stock market prices since it is a widely held belief that stocks are a hedge against inflation. This has undoubtedly stimulated demand for stocks on the part of investors and contributed indirectly to the growth of conglomerate companies.

The sustained economic growth during the 1960's of national product and income generally, is a facilitating element in the merger surge because it helps to offset possible dilution in earnings per share that might have occurred otherwise. Also, the growth in total revenue which can reasonably be expected to coincide with general economic growth would likely facilitate the attainment of higher leverage positions.

If the broad economic circumstances mentioned earlier should change, it is questionable whether or not conglomerates could sustain their current rate of mergers. Also, it is questionable whether or not they could continue to support their current leverage position. The effects on conglomerate earnings would, of course, depend upon such factors as the degree of actual diversification attained and how cyclical the total earnings of the company would be, given the changes in external conditions.

In the next chapter, some of the hazards awaiting the unwary, financially motivated conglomerate and its stockholders are examined. These hazards are ones which could arise, given the same external conditions in the future as have prevailed in the 1960's. In the last chapter, the effects which can arise from a change in external circumstances are suggested when different conditions are simulated.

Methods of External Expansion

Since this study is directed toward conglomerate companies, one factor which must be dealt with is the methods by which a company can become a conglomerate. The characteristic which distinguishes conglomerate companies from other companies which have followed the merger route to growth is that conglomerates have acquired diverse firms instead of those bearing significant horizontal, vertical, or circular relationships. Accordingly, a firm can become a

conglomerate by acquiring diverse units, and this is almost always done by external rather than internal means. The methods of external expansion are the same for conglomerate companies as for any other company. Namely,

- (1) By merger
- (2) By consolidation
- (3) By purchase of assets
- (4) By holding company
- (5) By leasing

It is assumed that the distinction between the five avenues of external expansion is reasonably clear so that a detailed explanation of them is not necessary. Briefly, a merger can be distinguished from a consolidation by virtue of one company involved in the combination absorbing another and retaining its own identity, while the company being absorbed is dissolved and loses its identity. In the case of a consolidation, two companies or more are brought together and a new one created with a new identity. Securities, property, and cash can be exchanged in both types of transactions.

Purchase of assets of one company by another is frequently done to avoid getting approval of the stockholders of the acquiring company. That is, in mergers and consolidations, generally both companies' directors and stockholders must approve the transaction ahead of time. In the case of the purchase of the assets of one company by another, it is

not normally necessary for the acquiring firm to get approval from its own stockholders.²

Holding companies can be either holding-operating operating companies or operating-holding companies, depending upon the nature of the parent company.³ When the holding company route to expansion is used, the subsidiaries acquired or formed retain their own separate identity, and the stock of these companies is treated as an investment by the parent company. Special advantages accrue to this type of external expansion, and it is probably the dominant form used by conglomerates.

Leasing is, of course, one method of acquiring assets externally. Title is not transferred through leasing, so it may not really be classified as a method of external expansion. In any case, leasing and purchase of assets as methods of external expansion are not significant and can be ignored for practical purposes as having no effect or influence on the current merger movement.

Pooling Versus Purchase Accounting

It is possible for a parent company to acquire the resources of another company by either merger, consolidation,

²Ernest W. Walker, Essentials of Financial Management (Englewood Cliffs, New Jersey, 1965), p. 92.

³Charles L. Prather, Financing Business Firms (Homewood, Illinois, 1961), p. 577.

or through a holding company and then simply merge the book values of both companies together in its financial reporting. To do this, however, the acquisition must be considered a pooling of interest rather than a purchase. Pooling is advantageous because, relative to the purchase method--which requires recognition of premiums paid over book values, calculations of income and rate of return on investment are maximized. To illustrate the conditions necessary for pooling, consider the following sequence of events.

Company M is a parent company conglomerate which openly admits that it seeks out subsidiaries which will lead to an immediate increase in earnings per share. Company M recognizes the desirability of treating its acquisitions as poolings rather than purchases; however, it must be able to meet the criteria of the American Institute of Certified Public Accountants regarding the conditions for poolings. According to these guidelines a pooling is

. . . a business combination of two or more corporations in which the holders of substantially all of the ownership interest (basically common stock) in the constituent corporations become the owners of a single corporation which owns the assets and businesses of the constituent corporations, either directly or through one or more subsidiaries, and in which certain other factors are present.⁴

The other factors which must be met if a combination is to be considered a pooling include the following:

⁴American Institute of Certified Public Accountants, "Business Combinations," Accounting Research and Terminology Bulletins (New York, 1961), Bulletin No. 48, p. 22.

- (1) The extent to which shares received by the several owners of one of the predecessor corporations are in proportion to their respective interests in such predecessor;
- (2) If voting rights are materially altered;
- (3) A plan or intention to retire a substantial part of the capital stock issued to the owners of one or more of the constituent corporations, or other substantial changes in ownership occurring before or planned to occur shortly after the combination;
- (4) Abandonment or sale of a large part of the business of one or more of the constituents;
- (5) The continuity of management; and
- (6) Size of constituents.⁵

No one of the above factors would necessarily be determinative and any one factor might have varying degrees of significance in different cases. In short, the distinction between when pooling accounting should be used and when purchasing should be used is impossible to define precisely. This situation has led, in the case of conglomerates, to almost complete use of pooling. "In short, pooling has become the 'in thing' and one must look far and wide before one now finds an acquisition which is being accounted for as a purchase."⁶

⁵Ibid., pp. 22-23.

⁶Abraham J. Briloff, "Distortions Arising from Pooling-of-Interests Accounting," Financial Analysts Journal, XXIV (March-April, 1968), p. 73.

Some Hypothetical Transactions

As long as Company M does not need to worry too much about meeting the requirements of pooling--since it apparently can be justified rather easily--the main concern of Company M is the efficiency of its acquisitions. That is, Company M wants to acquire at all times in such a manner that its acquisitions will have the most beneficial effect on earnings per share.

A favorable candidate is selected, and Company M decides to trade common stock for common stock with the company to be acquired. Rather than getting a new authorization from its shareholders, Company M decides to buy its own stock in the open market (and artificially raise the price, thereby improving its bargaining position with the company to be acquired) and then trade the stock purchased for that of the company to be acquired. Clearly, Company M is paying cash for the company; yet, the final transaction involves an exchange of stock, and it is therefore treated as a pooling for accounting purposes.

Encouraged by the success of its first acquisition, Company M decides to buy another through a cash tender offer. By buying the shares of the company with cash, the need for registration with the Securities & Exchange Commission and other difficulties with the company's shareholders are avoided. In fact, the cash tender offer can be arranged so that, if the desired percentage of total ownership is

not acquired, the shares can be returned and the deal called off.

Company M is successful in its cash tender offer and acquired controlling interest in the company. Company M is now assured of voting control without effective resistance from the remaining stockholders and the board of directors. Also, Company M is in a position to exchange securities with the subsidiary company on favorable terms and treat the transaction as a pooling of interest because ownership is continuous.

Instead of merging with the company just acquired, Company M decides to operate as a holding company and borrow money, using the stock of the company just acquired as collateral. With the funds derived from the loan, Company M purchases the common stock of an additional company. By following this procedure, Company M knows that it will be able to pyramid several levels of debt upon a single set of productive assets. This is possible because debt at the parent company level is backed primarily by its holdings of stock in the subsidiaries. The subsidiaries, in turn, rely on the real resources employed and their income potential as collateral. Through pyramiding in this manner, the real assets are supporting debt at the subsidiary level and again at the parent level through income generated and transferred to the parent company. If the subsidiaries can be encouraged to become holding companies themselves, then it may be

possible to extend the overall leverage position even further. That is, with three levels in the holding company, the real assets at the lowest level could be used to support debt, at least in part, at the two higher levels.

With three levels in the holding company, and debt incurred at every level, Company M can be viewed, in terms of the leverage position of a nonholding company, as a company which has used its own securities twice as collateral for debt. Obviously, this is a neat trick if it can be carried out.

Being pushed for cash, Company M knows that investors are rather naive, particularly with regard to conglomerate companies, and decides that it would really be an astute move to break up the subsidiary just acquired and form several other corporations--letting the market try to value the new shares. When the time is right, Company M sells off 10 to 15 percent of its holdings in the new companies and uses the proceeds to help meet maturing obligations.

Company M is now pretty well conditioned to some of the basic rules of the game; however, other considerations are now necessary in its acquisition decisions. Because of increasing needs for cash to support additional acquisitions and the high leverage position, the company would be wise to begin spending part of its time and resources looking for companies to acquire which are of this nature:

- (1) Under capitalized,

(2) Have low book values relative to liquidation value of assets, and/or

(3) Have a favorable cash flow position.

Ideally, the companies acquired would add to earnings per share and also possess one or more of the forementioned characteristics. At some point, however, the company would be willing to accept a slight dilution in earnings per share in return for the added debt or cash which would be derived from a company possessing the desired characteristics.

If the company acquired had low book values relative to liquidation values, then it could be used to extend the overall leverage position of the firm. The same is true for a firm which is undercapitalized--i.e., additional debt could be incurred at the subsidiary level and then magnified through the holding company device. If the firm to be acquired possessed a favorable cash flow position, it would be attractive as a means for helping to meet maturing debt obligations or to finance additional acquisitions.

In its acquisitions, Company M would prefer to give convertible preferred stock or preference stock because dilution of earnings per share of the common can be delayed until additional companies have been acquired and additional amounts of convertible preferred and preference stock have been issued to take the place of those which have been converted. Preference stock with an increasing conversion ratio is preferable from Company M's point of view because such a

feature has a built-in incentive not to convert unless the price of the company's stock declines.

While all of the moves open to Company M have not been covered, a sufficient number have been illustrated to indicate that growth through external means is, or can be, a rather demanding process--demanding in that the company must not only find acquisition candidates which add immediately to earnings per share but also must arrange methods for their financing, which is one of the determining factors in whether or not earnings per share are increased. In fact, the acquisition and financing processes could be so demanding that, at least at the parent company level, little time would be available for such small matters as releasing synergy--particularly since, with a few exceptions, one of the major characteristics of conglomerate companies is a relatively small management staff at the parent company level.

While the method of financing and the organization used for acquiring--i.e., merger, consolidation, or holding company--are important, if a company is to be successful as a financially motivated conglomerate, it must, on the average, make acquisitions which raise earnings per share. Of course, as noted previously, some percentage of acquisitions can occur because of their effect on cash flow or leverage potential.

Acquisition Income

In the first chapter it was indicated that the income per share of a conglomerate company could be broken down into that which is derived from the parent company and that which is attributable to the resources of the subsidiary companies. The total income per share was denoted by the following:

$$Y_t = \frac{E_p (1+g_p)^t \cdot Y}{Y + tZ} + \sum_{k=0}^{k=t-1} \frac{T_{es} (1+g_s)^k \cdot Z}{Y + tZ}$$

parent
subsidiaries

As the company described by the equation above moves from one time period to another, income can be attributed to two sources--operating income and acquisition income. By definition, operating income is that income which is derived from parent and subsidiaries which were acquired prior to the current time period, and acquisition income is that income which is attributable to subsidiaries acquired during the current period. The distinction between the two sources of income is made because acquisition income can be used to obscure the operating growth trend of a particular firm.

A firm can consolidate its reports with those of a subsidiary acquired anytime prior to the closing of its own books. Accordingly, it is possible, as demonstrated in the first chapter, for a firm whose actual productivity is declining to show a gain in overall income simply by acquiring on favorable terms. The use of acquisition income

to create a favorable impression was noted by Manuel F. Cohen at a seminar at the University of Illinois:

There are also ways to increase a company's reported sales and earnings without improving performance--and here I speak of performance in its traditional sense. The easiest way, perhaps, is simply to add the sales and earnings of another company through merger or acquisition . . . And if, as has happened in some cases, the combined sales and earnings are compared with the unadjusted figures of the acquiring company for earlier periods, the increase in sales and earnings appears even more dramatic.

This accounts, in part at least, for the current rash of acquisition--hundreds, thousands of acquisitions--and for the growth of the conglomerate company.⁷

For purposes of analysis, the equation

$$Y_t = \frac{E_p(1+g_p)^t \cdot Y}{Y + tZ} + \sum_{k=0}^{k=t-1} \frac{T_{es}(1+g_s)^k \cdot Z}{Y + tZ}$$

is rather inconvenient. This equation assumes constant forces are at work generating values for Y_t . Such an equation is applicable, perhaps, in attempting to project future income levels; however, it does not give explicit recognition to all of the leverage variables which play an important role in the attainment of income per share through acquisition.

⁷"Some Problems of Disclosure," The Journal of Accountancy, CXXV (May, 1968), p. 62, excerpted from an address by Manuel F. Cohen, Chairman, Securities and Exchange Commission, at the University of Illinois, Urbana, March 7, 1968.

The following equation is better for purposes of analysis because it includes all of the variables, regardless of the method of acquisition, which influences earnings per share from one period to another. Also, the equation explicitly recognizes return on total assets employed by the conglomerate company rather than rate of return per share. Rate of return on investment is viewed as a better variable than rate of return per share for determining the "value added" by conglomerates. The rate of return on total investment is transferred to per-share earnings by recognition of leverage variables. Accordingly,

$$E_S = \frac{(1-T) [(R_I) (I) - (R_d) (D)] - (R_p) (P) - (R_m) (M)}{S}$$

In the above equation,

E_S = Earnings per share during a time period

T = Tax rate

R_I = Rate of return on investment during the time period

I = Average investment level during the time period

R_d = Rate of return (average) on debt capital during the time period

D = Average amount of debt capital employed during the period

R_p = Rate of return (average) accruing to preferred stock

P = Average amount of number of pfd. shares outstanding

M = Dollar value of minority interest

R_m = Rate of return per dollar to minority interest

S = Total number of shares of common stock outstanding

The equation for E_S is better than the one expressing Y_t for purposes of analysis because it looks specifically at the variables responsible for changes in earnings per share during a time period. Of course, the equation for E_S cannot be applied to future time periods without being subject to uncertainty, just as the equation for Y_t . It is more descriptive, however, when applied to past time periods.

Just as the equation expressing Y_t expresses earnings per share at some point in time "t," the equation for E_S could be used to express income per share (E_S) as a function of time if each of the independent variables were assumed to be a function of time. In fact, each of the variables listed above can be thought of as assuming different values per time period (from year to year, for example). E_S is the dependent variable, and all of the other variables are independent ones. Accordingly, if the value for one or more of the independent variables changes from one time period to another, there will be a corresponding change in E_S . Thus, if each of these variables is analyzed in an attempt to explain past levels of income per share, a more meaningful breakdown is possible than with the former equation.

Using the equation for E_S , the following example is presented to illustrate how a company can combine resources

which are declining in their individual growth rates (rate of return on investment) and still show an increase in rate of return from one time period to another. Also, the example illustrates how the artificial growth can be magnified through the leverage variables presented in the preceding equation.

Acquisition Income of Company M

The financing and organizational policies of Company M were discussed briefly in a preceding section; now, its acquisition policy is illustrated. Company M has the following characteristics:

Total Investment	\$200,000
Total Debt	\$100,000
Average Interest Rate on Debt	5%
Annual Interest Expense	\$ 5,000
Total Equity	\$100,000
Retained Earnings	\$ 50,000
Common Stock (20,000 shares outstanding)	
Preferred Stock (\$5 annual dividend)	
100 shares outstanding	
Tax Bracket	50%
Rate of Return on Investment	
(before interest and taxes)	10%
Price Earnings Multiple on Common Stock	.20 to 1
Growth Rate of Rate of Return on Investment	zero
Annual Gross Income	\$ 20,000
Income after Interest Expense	\$ 15,000
Income after Taxes and Preferred Dividends	\$ 7,000
Income per Share	35¢
Price per Share	\$ 7.00

As indicated in the preceding financial information, Company M has a zero growth rate in its rate of return on investment. If rate of return on investment is viewed as an index of efficiency and profitability, then it is possible

to state that Company M is remaining the same from one time period to another in terms of these characteristics. The reason that the parent company, Company M, is able to command as high a price-earnings multiple as it does is that it has been able to give the investment community the impression that it is a growth company by making acquisitions which give the impression that total rate of return on investment is increasing.

To illustrate how Company M is able to give the impression of being a growth company through its acquisitions, let it be assumed that the company acquires subsidiary companies with the following characteristics in each of four subsequent time periods:

Total Investment	\$100,000
Total Debt	\$ 25,000
Average Interest Rate	5%
Average Interest Expense	\$ 1,250
Total Equity	\$ 75,000
Retained Earnings	\$ 45,000
Common Stock (10,000 shares outstanding)	
Preferred Stock (none)	
Tax Bracket	50%
Rate of Return on Investment (before interest and taxes)	15%
Price-Earnings Multiple of Common Shares	10 to 1
Growth Rate of Rate of Return on Investment a minus one percentage point per year	
Gross Income in Year of Acquisition	\$ 15,000
Income after Interest Expense	\$ 13,750
Income after Taxes	\$ 6,875
Income per Share	\$.6875
Price per Share	\$ 6.875

Under the assumption that the "M" Company acquires a subsidiary with the above characteristics in each of four subsequent time periods, it is clear that the rate of return

on total investment employed is declining--i.e., the parent has no growth, and each subsidiary has a minus one percentage point per year.

While it is quite obvious from the preceding example that the overall growth rate is declining, notice the growth trend that the parent company is able to report because of its acquisitions:

Period Number Zero (Parent Company Alone) $R_I = 10\%$

Period Number One (Parent plus one Subs.)

$$R_I = \frac{(200,000)(10\%) + (100,000)(15\%)}{300,000}$$

$$R_I = 11.67\%$$

Period Number Two

$$R_I = \frac{(200,000)(10\%) + (100,000)(14\%) + (100,000)(15\%)}{400,000}$$

$$R_I = 12.25\%$$

Period Number Three

$$R_I = \frac{\text{Same Numerator as Above} + (100,000)(13\%)}{500,000}$$

$$R_I = 12.40\%$$

Period Number Four

$$R_I = \frac{\text{Same Numerator as Period Three} + (100,000)(12\%)}{600,000}$$

$$R_I = 12.34\%$$

The parent company can continue to sustain increases in R_I only so long as it can acquire companies whose R_I 's contribute more to current R_I than the negative growth rate

takes away. In spite of the eventual decline in R_I , Company M was able to give the impression over the entire acquisition period of having an increasing trend in R_I .

The preceding example suggests that a company can give the impression of being a growth company when it is actually declining in terms of its rate of return on investment. This illusion is not limited to overall rate of return but is transferred to earnings per share (and very likely magnified by changes in the leverage positions of parent and subsidiaries acquired). As noted in the first chapter, for income per share to be added through acquisition, the following must be true:

T_{es} must be greater than E_p

in

$$E_g = \frac{Z(T_{es} - E_p)}{Y + Z}$$

Where

E_p = Current earnings per share of parent company

T_{es} = Earnings per share of the resources of the acquired company after shares of the parent company are traded for those of the acquired company

Z = The number of shares traded of the parent company for those of the acquired company

Y = The number of shares of the parent company before acquisition.

The same relationship expressed in the previous equation can be defined more generally in terms of changes in the variables of the following equation:

$$E_s = \frac{(1-T) [(R_I)(I) - (R_d)(D)] - (R_p)(P)}{S}$$

Where, as before

E_s = Earnings per share

T = Tax rate

R_I = Rate of return on investment during the time period

I = Average investment level during the time period

R_d = Rate of return (average) on debt capital during the period

D = Average amount of debt capital employed during the period

R_p = Rate of return (average) accruing to preferred stock

P = Average amount of (number of) pfd. shares outstanding

S = Number of shares of common outstanding at the end of periods

If any one of the above variables changes due to acquisition of a subsidiary, then there will be a corresponding change in earnings per share--this is true also of changes arising from one period to another from internal operations. The following section presents the effects on earnings per share attributable to Company M's acquisitions.

Effects on Earning per Share of the Preceding Acquisitions

Earnings per share (assuming a 50% tax rate) in period number zero are

$$E_s = \frac{(.50) [(.10)(200,000) - (.05)(100,000)] - (\$5)(100)}{20,000}$$

$$E_s = 35 \text{ cents}$$

Earnings per share in period number one: (Assuming that the company acquired is paid for with 5% bonds and \$5 preferred stock, and also assuming that the company maintains its one-to-one debt-equity ratio and the same ratio of preferred stock to total investment.) Note that the acquisition terms are subject to negotiation and, so long as the parent company can acquire companies whose total earnings exceed fixed charges assumed in the acquisitions, then some contribution is made to equity holder's income. In the case at hand,

$$E_s = \frac{(.50) [(.1167) (300,000) - (.05) (150,000)] - (\$5) (150)}{20,000}$$

$$E_s = 65 \text{ cents}$$

Earnings per share in period number two: (This year's earnings are different from the previous period's income because of the acquisition of an additional subsidiary and also because of the decline in the rate of return on the subsidiary acquired in period number two.) To isolate the effect on income per share from acquisition alone, it would be necessary to subtract the earnings per share that would have occurred without acquisition from that which occurred with acquisition. Since this is not done, the income per share calculated below is the cumulative effect of changes in the rate of return on investment from all preceding acquisitions.

$$E_s = \frac{(.50) [(.1225) (400,000) - (.05) (200,000)] - (\$5) (200)}{20,000}$$

$$E_s = 93 \text{ cents}$$

Earnings per share in period number three:

$$E_s = \frac{(.50) [(.124) (500,000) - (.105) (250,000)] - (\$5) (250)}{20,000}$$

$$E_s = \$1.18$$

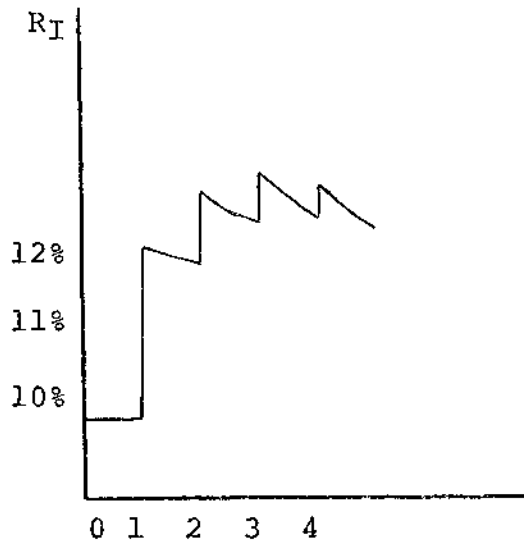
Earnings per share in period number four:

$$E_s = \frac{(.150) [(.1234) (600,000) - (.105) (300,000)] - (\$5) (300)}{20,000}$$

$$E_s = \$1.40$$

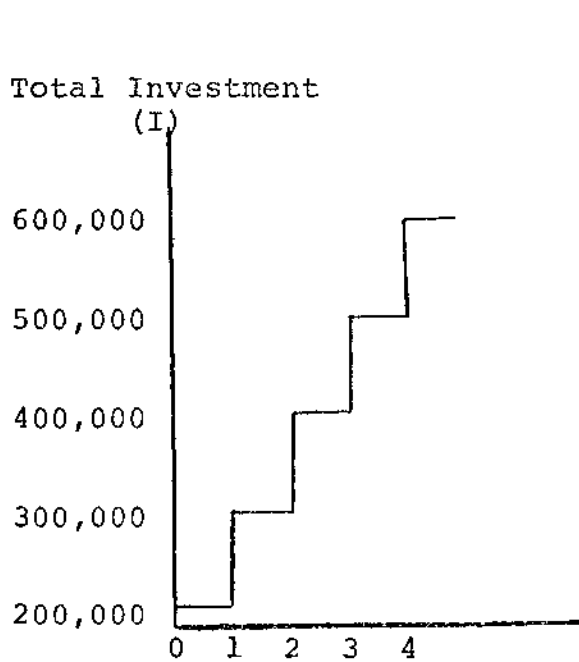
Summary of Operating and Acquisition
Performance of Company M

The examples presented in Figures 14 through 20 should illustrate clearly that not only is it possible for increases in rates of return on investment to be passed on to common stockholders, but, also, such increases can be greatly magnified in terms of earnings per share. Even more significant is a conglomerate's ability to give such an impression of growth when, in reality, the productivity of resources is declining. The secret lies in the calculation of growth rates for conglomerate companies relative to the past period rate of return for the conglomerate and not relative to the past rate of return for the resources employed--i.e., traditional calculations are not geared for companies which acquire most of their productive resources secondhand.



R _I	Time
10 %	0
11.67%	1
12.25%	2
12.40%	3
12.34%	4

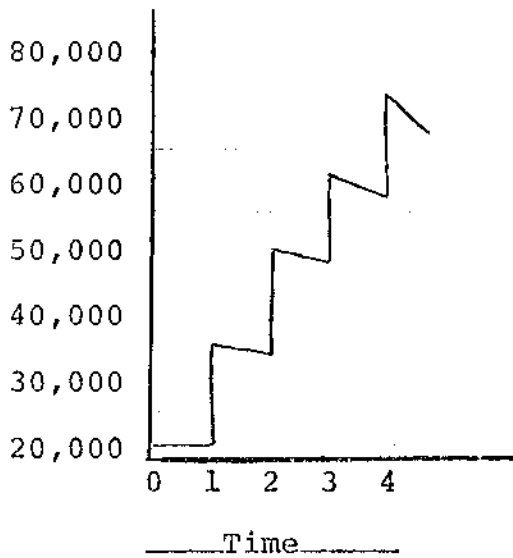
Fig. 14--Trend in rate of return on investment for Company M.



Total Investment	Time
200,000	0
300,000	1
400,000	2
500,000	3
600,000	4

Fig. 15--Trend in total investment for Company M

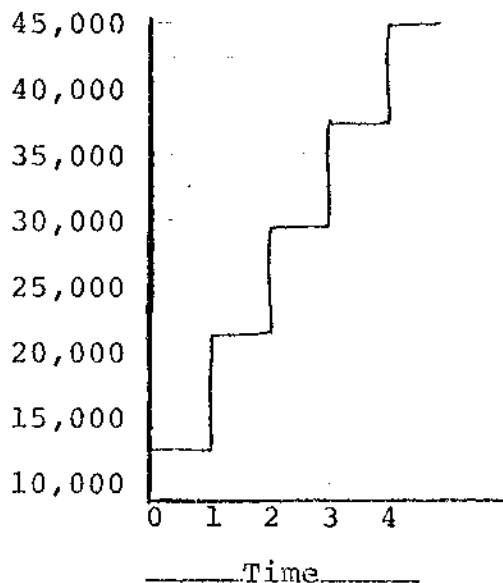
(I) (R_I)



Total Revenue	Time
20,000	0
35,000	1
49,000	2
62,000	3
74,000	4

Fig. 16--Trend in total revenue for Company M

Fixed Charges
(debt and taxes)

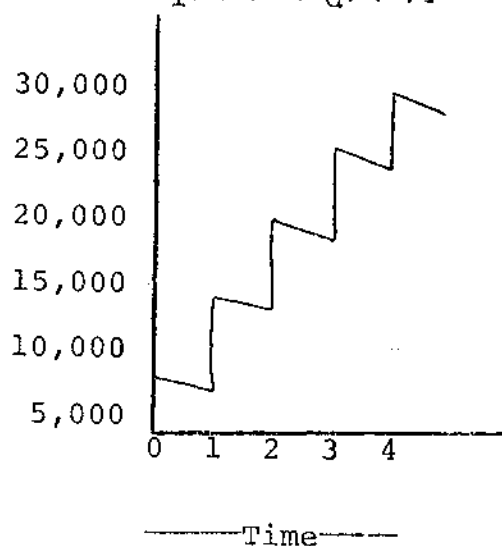


Fixed Charges	Time
12,500	0
21,255	1
29,500	2
37,250	3
44,520	4

Fig. 17--Trend in fixed charges for Company M

Net Contribution
to Equity

$$(1-T) [(R_I) (I) - (R_d) (D)]$$



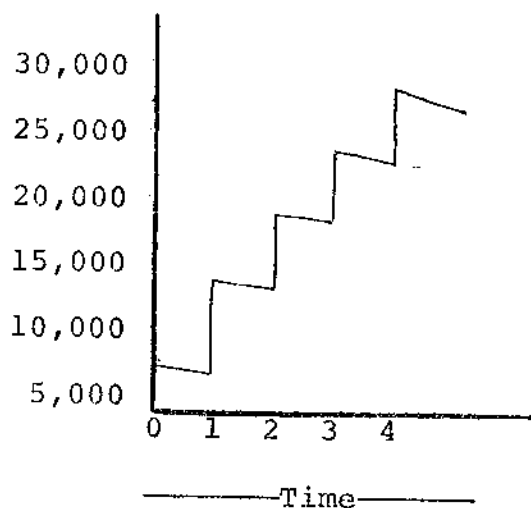
Net Contribution to Equity

Net Contribution to Equity	Time
7,500	0
13,745	1
19,500	2
24,750	3
29,480	4

Fig. 18--Trend in net contribution to equity for Company M.

Net Contribution
to Equity Minus
Preferred Income

$$(1-T) [(R_I) (I) - (R_d) (D)] - (R_p) (P)$$



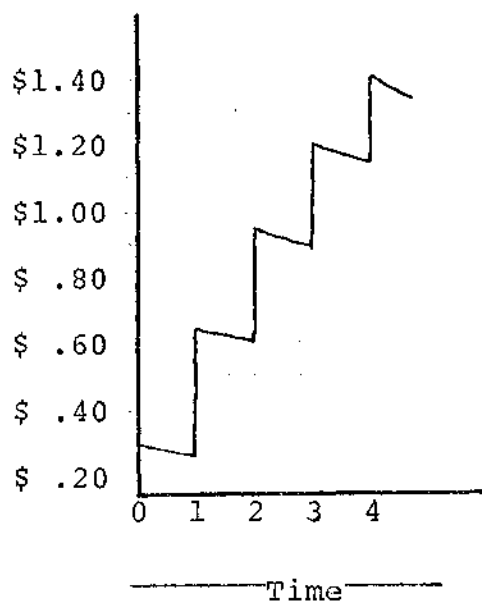
Net Contribution to Equity Minus Preferred Income

Net Contribution to Equity Minus Preferred Income	Time
7,000	0
12,995	1
18,500	2
23,500	3
27,980	4

Fig. 19--Trend in net contribution to equity minus preferred income for Company M.

Earnings
per Share

$$\frac{(1-T) [(R_I) (I) - (R_d) (D)] - (R_p) (P)}{S}$$



Earnings Time
per Share

\$.35 0

\$.65 1

\$.93 2

\$1.18 3

\$1.40 4

Fig. 20--Trend in earnings per share for Company M

Effects on Market Price of Common Stock

One of the initial assumptions was that the investment community viewed the "M" Company as a growth company (because of its rising R_I), and, accordingly, the community was willing to pay a price-earnings multiple of twenty to one. Under these assumptions, the price per share in period one would be \$7.00; in period two it would be \$13.00; in period three it would be \$18.60; in period four, \$23.40; and in the last period, \$28.00. Or, for the entire period, the market price of the stock would have appreciated by more than 300 percent, while the company's total resources employed continued to become less productive.

How Long Can Acquisition Be
Used for Growth Purposes?

Unfortunately, the growth rate of the conglomerate is the investment-weighted average growth rate of all groups of resources employed; therefore, once a company becomes committed to a growth policy from acquisition alone, larger or more frequent acquisitions become imperative if the past growth rate is to be maintained. If, as in the case of Company M, a company becomes committed to a policy of acquiring companies with negative growth rates for their immediate effect on R_I --progressively larger acquisitions must be made to offset the effects of the overall negative trend, and at some point earnings will become negative.

CHAPTER VI

GROWTH TRENDS UNDER CONDITIONS OF SUSTAINED ACQUISITIONS

For discussion purposes, the effects of a parent company's acquisitions in a series of time periods can be viewed as a repetition of the effects of the single acquisitions which were presented in Chapter I. Recall that in terms of relative values for T_{es} , E_p , g_p , and g_s , there are six possible combinations for describing single acquisitions:

- (1) $T_{es} > E_p$ and $g_s > g_p$
- (2) $T_{es} > E_p$ and $g_s = g_p$
- (3) $T_{es} > E_p$ and $g_s < g_p$
- (4) $T_{es} < E_p$ and $g_s > g_p$
- (5) $T_{es} < E_p$ and $g_s = g_p$
- (6) $T_{es} < E_p$ and $g_s < g_p$

Of the six combinations listed above, three are not feasible as models for the long-run strategy of firms attempting to add earnings per share through acquisitions. They are not feasible because in these three particular instances, where T_{es} is less than E_p , earnings per share are diluted rather than increased by acquisition.

The three remaining strategies (1, 2, and 3 above) make immediate additions to earnings per share. Of the three

strategies, number one is the most desirable, number two is the next most desirable, and number three is the least desirable. This is the order of preference from the parent company's point of view because in situation one both immediate earnings per share are increased and the operating growth trend of the total company is improved. In situation two an immediate addition in earnings per share is made, but the operating growth rate remains the same for the company before and after acquisition. In situation three an immediate increase in earnings per share is made, but the long-run operating growth trend is diminished.

Unfortunately, since the relative operating growth rates of the companies determine, or should logically determine, the terms on which a parent company can acquire a particular subsidiary, the combinations most easy to consummate with a positive immediate effect on earnings per share are the ones having the least favorable effect on the long-run operating growth trend. Accordingly, there would be a tendency for acquisition candidates in terms of positive E_g 's to be ranked (3), (2), and (1)--in that order. That is, the most favorable candidates for merger in terms of both immediate income effect and effect on operating growth trend are the ones hardest to acquire on favorable terms if the overriding factor in the exchange of ownership is the relative growth rates of the parent and subsidiary.

In terms of graphs, the three positive acquisition models are presented in Figure 21:

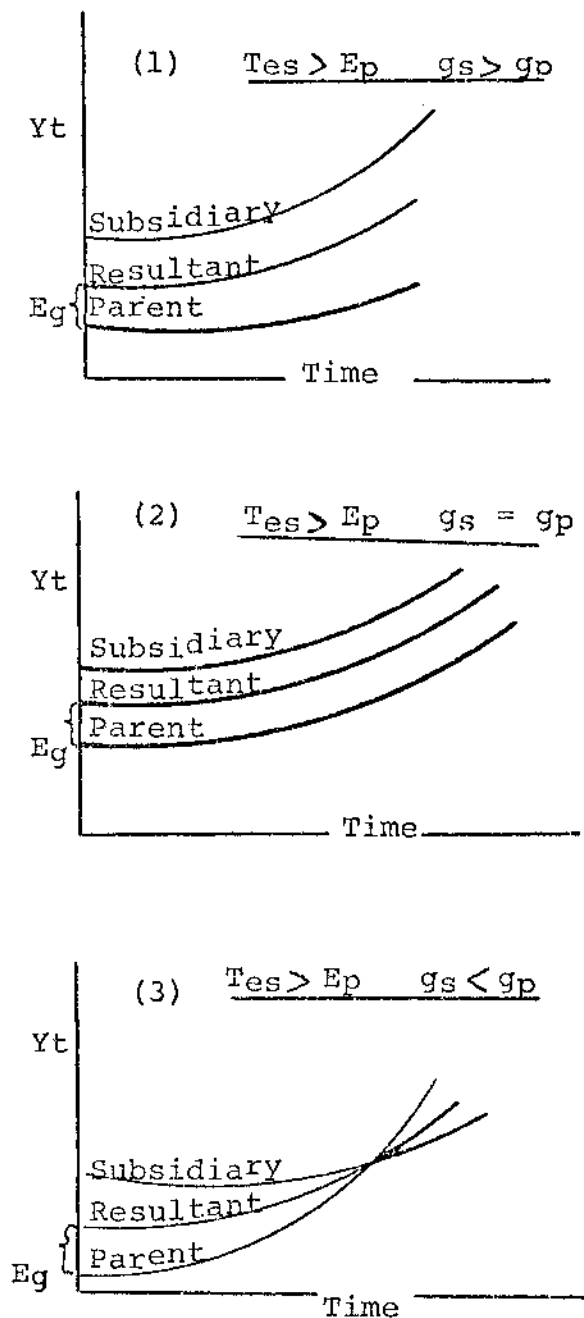


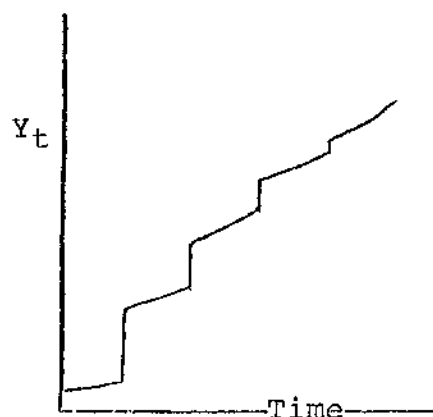
Fig. 21--Trends reflecting positive acquisition income from single acquisitions.

The equation for the resultant follows:

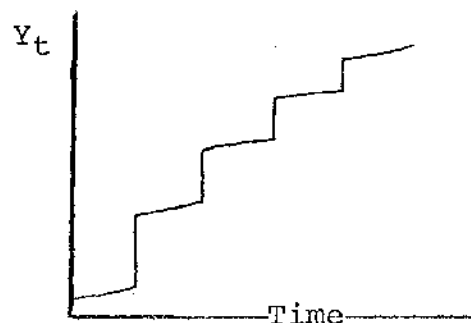
$$Y_t = \frac{E_p (1+g_p)^t \cdot Y}{Y + Z} + \frac{T_{es} (1+g_s)^t \cdot Z}{Y + Z}$$

If the long-run trend of income per share of a conglomerate is viewed as a series of resultants--one building on another, then the growth trend over time might look similar to the following for each of the three feasible acquisition strategies: (where T_{es} and g_s remain constant for each subsidiary acquired)

(1) $T_{es} > E_p$ and $g_s > g_p$



(2) $T_{es} > E_p$ and $g_s = g_p$



(3) $T_{es} > E_p$ and $g_s < g_p$

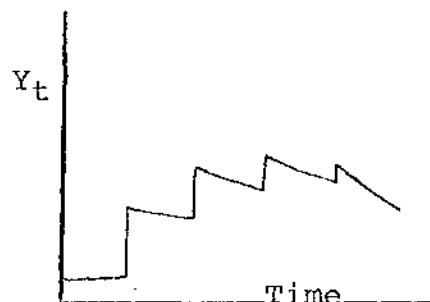


Fig. 22--Long-run trends resulting from sustained acquisitions which add immediately to earnings per share.

The equation for the zig-zag line in each of the three cases is

$$Y_t = \frac{E_p(1+g_p)^t \cdot Y}{Y + tZ} + \sum_{k=0}^{k=t} \frac{T_{es}(1+g_s)^k \cdot Z}{Y + tZ}$$

and

$$E_{gt} = \frac{(T_{es} - Y_t^*)Z}{Y + tZ}$$

E_{gt} denotes immediate increase in earnings per share as a function of time

where

$$Y_t^* = \frac{E_p(1 + g_p)^t \cdot Y}{Y + tZ} + \sum_{k=1}^{k=t} \frac{T_{es}(1 + g_s)^k \cdot Z}{Y + tZ}$$

Figure 23 magnifies case number one of Figure 22. In the diagram presented in Figure 23, the upward operating trend of both parent and subsidiaries acquired manifested in an increasing Y_t^* causes each successive E_{gt} to be smaller than the previous one. This means that the continued acquisition of the same subsidiary on the same terms per time period will have a decreasing absolute effect on total income per share. Also, in percentage terms, the effect of the subsidiaries' operating growth trends will have a greater effect in earlier time periods than in later ones because the total operating growth trend is the investment-weighted average of parent and subsidiaries, and the size needed to have the same effect becomes progressively larger. This means that the overall

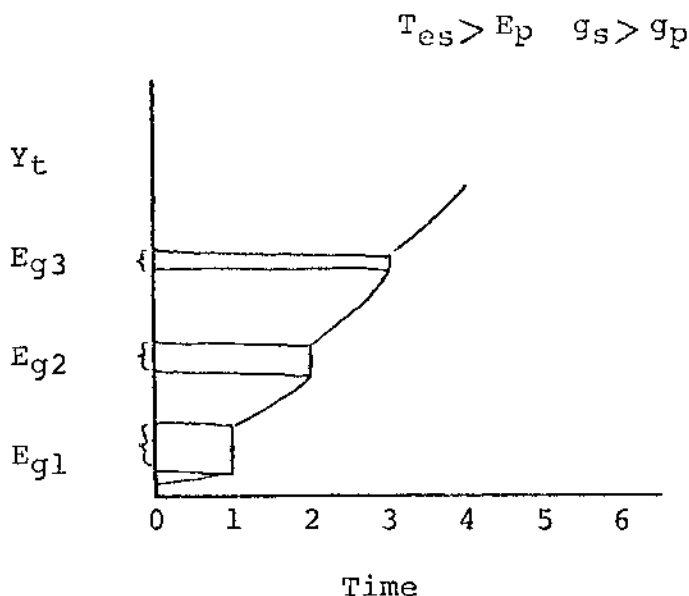


Fig. 23--Long-run trend in earnings per share when acquisition income is positive and g_s is greater than g_p .

growth trend attributable to acquisition income and operating income is highest in earlier periods. Accordingly, if one attempted to make a future projection of earnings based upon income generated during early periods, the projection would not be realistic when compared to that which would transpire under the conditions assumed to exist.

In order to sustain the same growth trend through acquisition in later periods, it would be necessary for the parent to increase the size or rate of acquisition or to acquire on more favorable terms than in earlier periods. In any case, the long-run trend will approach its operating trend due to limits which exist on the ability of a firm to continually increase in a favorable manner the size, rate, or terms of acquisition.

In case number two, the same generalizations can be drawn as were drawn about case number one; however, E_{gt} does not decline in absolute terms as rapidly as it did in case number one. E_{gt} does not decline as rapidly because the operating growth trends of the subsidiaries acquired are less, relative to those in case number one. In case number three, the influence of acquisition income is more pronounced and endures longer because Y_t^* is not increasing as rapidly in this instance as it was in cases one and two. It is not increasing as rapidly because of the relatively lower growth trend of the subsidiaries being acquired.

In all three cases, if the overall growth trend of parent and subsidiary combined is negative, then, as illustrated in Chapter I, acquisition income can be used to create the impression of an overall growth trend only so long as the total decrease from operating earnings is offset by increases from acquisition. Beyond some point, however, earnings per share will begin to decline absolutely.

In all three cases, when the operating trend is positive, the effects of acquisition are more pronounced in early periods than in later ones; this means that earnings projections of past experience are biased in a positive manner, but to varying degrees--depending upon operating growth trends of subsidiaries acquired. The positive bias in early periods means that any projections of earnings will be inherently high, relative to the operating trend upon which

acquisition income is added. This situation can be viewed in graphic form in Figure 24.

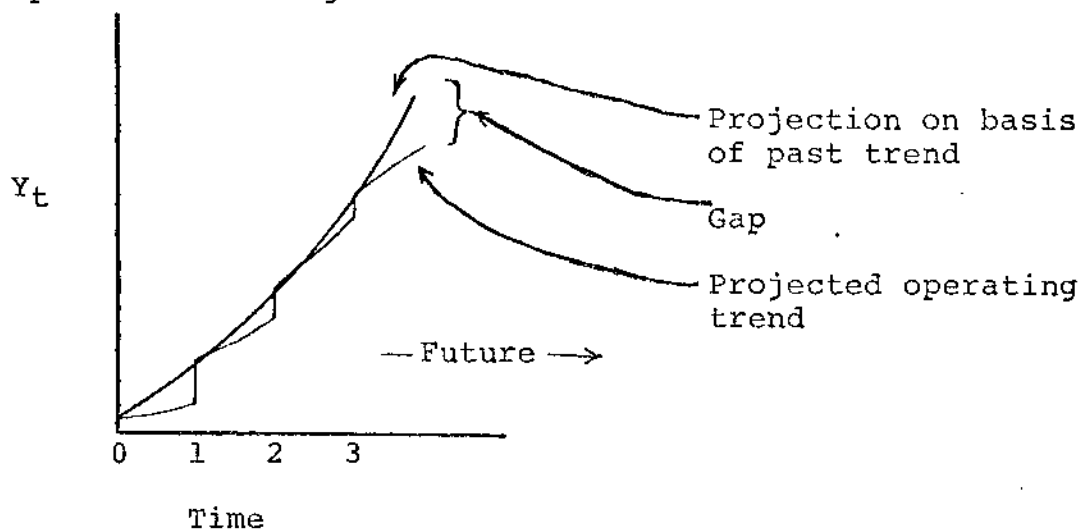


Fig. 24--Gap between operating trend and total income trend.

It is the gap between operating trend and total per-share earnings trend which can allow a conglomerate company to acquire subsidiaries which make a positive immediate contribution to earnings and also contribute to the overall operating trend. That is, in its bargaining with a subsidiary, a parent company can point to the earnings trend which includes both past operating and past acquisition income and compare it to the operating trend of the subsidiary.

It is possible, and even probable, that in many instances the combined trend of acquisition and operating income of the parent is greater than the operating trend of the parent while the operating trend of the parent is less than that of the subsidiary. Under such conditions, the parent company

is in an excellent position to add to both components of its income per share. Of course, as the preceding examples illustrated, a company is able to sustain its total trend in earnings only so long as it is able to increase in a favorable manner the size, rate, or terms of acquisition; unless this is done, the gap between total earnings per share and operating earnings will begin to close. In the interim, the unwary subsidiary and its stockholders can be deceived.

The source of the deception lies in the inapplicability of the traditional concept of growth to financially oriented conglomerates. That is, growth through acquisition is a different form of growth than that which occurs through internal means. Normally, growth through internal expansion carries with it the implication that the firm is experiencing a strong demand for its products because of some special attribute of the product or the production process from which the product is derived. Furthermore, such demand is normally expected to endure for an extended time period, perhaps following a geometric pattern over time. On the other hand, growth through external means can occur when actual demand and actual operating profitability are declining; also, such growth can be terminated by such factors as unfavorable swings in the stock market or changes in the attitude of the antitrust authorities. Clearly, a distinction should be made between the two types of growth.

Difficulties Encountered in the Valuation of Shares in Conglomerates

As noted in the previous section, anyone attempting to value shares in conglomerate companies must reconcile numerous variables. The presence of numerous variables cause the following circumstances to arise:

(1) At any point in time, the earnings per share are a product of both operating income and acquisition income. Furthermore, if it is assumed that the subsidiaries which are acquired, on the average, are ones which add immediately to earnings per share, then the trend implied by the past record will be inherently higher than the operating trend.

(2) There is a continually changing operating growth trend in earnings per share if the resources acquired have different growth rates from those of the parent and other subsidiaries.

(3) Future income levels depend on size, rate, and terms of acquisition, as well as on operating income.

(4) Changes in the overall leverage position influence earnings per share.

The gap between operating trend and total income trend is graphically illustrated in Figure 25.

Sources of Income

If an observer is at time period four of Figure 25, then the past trend in earnings per share which is observed is the combined trend from both acquisitions and operations. In

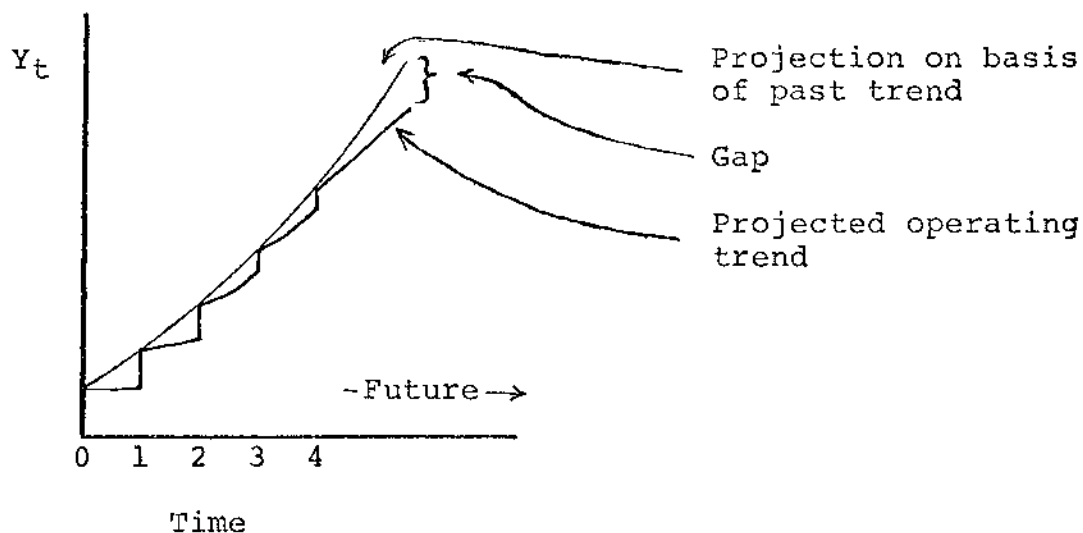


Fig. 25--Gap between operating trend and total income trend.

order for a projection of the past trend into the future to be realistic, the same percentage increases in earnings per share must arise collectively from the following sources of income:

- (1) Size of acquisitions,
- (2) Profitability of acquisitions,
- (3) Rate of acquisitions,
- (4) Synergy release,
- (5) Internal expansion of income, and
- (6) Changes in the leverage position.

That is, in order for a conglomerate company to sustain its past growth rate or keep the gap between operating earnings and acquisition earnings from closing, it must increase from period to period one or more of the preceding variables, relative to the prior period.

Under current conditions, it is impossible to determine precisely which of the sources of income are the major ones responsible for the dramatic growth in earnings per share of many conglomerates. Conglomerate companies' spokesmen aver that it is sources four and five which account for a considerable part of growth, and, unless these are sources of growth, it is questionable whether or not such growth can be sustained.

The hypotheses presented in the preceding chapter were derived to test the proposition that, contrary to what is being suggested by the spokesmen for conglomerates, the main sources of growth to conglomerate companies are not four and five, but some combination of the others. Pursuant to this objective, the equation for Y_t below cannot be used effectively to isolate the changes in income from all of the fore-mentioned variables.

$$Y_t = \frac{E_p(1+g_p)^t \cdot Y}{Y + tZ} + \sum_{k=0}^{k=t} \frac{Tes(1+g_s)^k \cdot Z}{Y + tZ}$$

Definitions:

- (1) Real variables-- R_I , I , gR_I , and gI
- (2) Leverage variables-- T , R_d , D , P , R_p , M , R_m , and S
(R_m refers to rate of return paid to minority interest and M refers to minority interest.)

For purposes of analysis, the following equation for Y_t is more appropriate than the one above. This equation is more appropriate because it gives recognition to both the

real variables and the leverage variables which determine Y_t .

$$Y_t = \frac{(1-T) [(R_{I_p})(I_p) - (R_{d_p})(D_p)] - (R_{p_p})(P_p) - (R_{m_p})(M_p)}{S_p} + \sum_{a=0}^{a=n} \frac{(1-T) (R_{I_a})(I_a) - (R_{d_a})(D_a) - (R_{p_a})(P_a) - (R_{m_a})(M_a)}{S_a}$$

In these latter expressions, the subscript "p" denotes variables which are descriptive of the parent company, and the subscript "a" denotes the values for each of "n" subsidiaries that are acquired. To be used to project future values for Y_t , each of the independent variables in the equation must be endowed with orderly values over time.

The second of the two terms in the equation expresses the net contribution to earnings per share by the subsidiaries acquired, where such subsidiaries are assumed to be financed in a specific and identifiable manner. In reality, it is not always possible to determine how individual acquisitions are financed--particularly if cash or some combination of cash and other securities is given up during acquisition. Also, it is difficult or impossible to distinguish between sources of financing internal and external expansion. Accordingly, the following equation is a restatement of the preceding one in terms of combined real variables and combined leverage variables for both parent and subsidiaries:

$$Y_t = \frac{(1-T) [(I_p) (R_{I_p}) + \sum_{a=0}^{a=n} (I_a) (R_{I_a}) - (R_d) (D)] - (R_p) (P) - (R_m) (M)}{S}$$

Again, as before, in order to be a predictive model, each of the preceding variables must be considered to follow some pattern of behavior over time.

Real Variables Expressed as Functions of Time

If, for the time being, attention is directed only to the real variables in the preceding equation, and if these variables are expressed as functions of time, then gross income is as follows:

$$(I_t) (R_t) = I_p (1+g_{I_p})^t \cdot R_{I_p} (1+g_{R_{I_p}})^t + \sum_{a=0}^{a=t} I_a (1+g_{I_a})^{t-a} \cdot R_{I_a} (1+g_{R_{I_a}})^{t-a}$$

Gross Income	Contribution to Gross Income by Parent	Contribution to Gross Income by Subsidiaries
-----------------	-------------------------------------------	-------------------------------------------------

In this equation, I_t is total investment, R_t is rate of return on total investment, and t is time. The equation is defined so that all of the acquisitions of a single time period are treated as one acquisition, and the related real variables are the average ones for the period. From one period to the next, however, recognition of different values for the real variables associated with acquisitions are recognized. For example, letting a different subscript denote a different period's acquisitions, when $t = 0$,

Contribution to Gross
Income by Subsidiaries is-- $(I_0) (R_0)$

When $t = 1$, the Contribution
to Gross Income is-- $(I_0)(1+gI_0)^1 (R_{I_0})(1+gR_{I_0})^1$
plus
 $(I_1)(R_1)$

When $t = 2$, the Contribution
to Gross Income is-- $(I_0)(1+gI_0)^2 (R_{I_0})(1+gR_{I_0})^2$ plus
 $(I_1)(1+gI_1)^1 (R_{I_1})(1+gR_{I_1})^1$ plus
 $(I_2)(R_2)$
and so on.

Solving the preceding equation for R_t , it becomes

$$R_t = \frac{I_p(1+gI_p)^t \cdot R_{I_p}(1+gR_{I_p})^t}{I_t} + \sum_{a=0}^{a=t} \frac{I_a(1+gI_a)^{t-a} \cdot R_{I_a}(1+gR_{I_a})^{t-a}}{I_t}$$

Term A Term B

If a parent company with the real variables denoted in the preceding equation acquires subsidiaries per time period such that R_{I_a} is greater than the R_t that would otherwise have occurred, then the pattern of R_t generated by a series of acquisitions might look similar to the following:

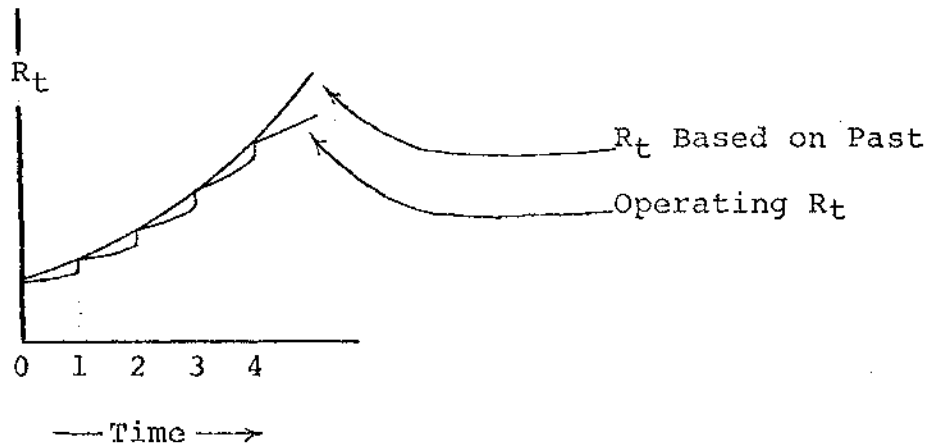


Fig. 26--Divergence between past trend and operating trend.

In other words, acquisitions can create a gap between projected trend (trend from both operating and acquisition sources) and the operating trend--just as in the case of earnings per share.

Value Added

If the real variables contained in the previous equations are redefined as the ones which would have occurred if the parent and subsidiaries had not been combined, then

$$R_t = \text{Term A} + \text{Term B} + \begin{array}{l} \text{Changes Occurring} \\ \text{Because of} \\ \text{Combination} \end{array}$$

If changes in rate of return on investment occurring because of combination are considered to be the result of synergy release, which can be positive or negative, then the latter term in the equation above can be considered a measure of the amount of synergy released in the combination.

As a practical matter, due to the consolidation of income and the physical combination of parent and subsidiary companies, the separate operating trends of parent and subsidiaries are obscured; therefore, Term A and Term B cannot be determined precisely after combination. Because of this limitation, the following modifications are introduced:

- (1) gI_a and gRI_a are allowed to be approximated for each subsidiary by the trend occurring prior to acquisition

- (2) Term A is replaced by--
(denoted by A')

$$\frac{(I_p)(R_{I_p})}{I_p + \sum_{a=0}^{t-1} (I_a)(1+gI_a)^{t-a}}$$

- (3) Term B is replaced by--
(denoted by B')

$$\frac{\sum_{a=0}^{a=t} I_a (1+gI_a)^{t-a} \cdot R_{I_a} (1+gR_{I_a})^{t-a}}{I_p + \sum_{a=0}^{a=t} I_a (1+gI_a)^{t-a}}$$

- (4) "k" is the multiple needed to equate R_t actually experienced with Term A' plus Term B'

Implementing the modifications listed above, the expression for R_t becomes

$$R_t = k [\text{Term A}' + \text{Term B}']$$

or

$$R_t = k \left[\frac{(I_p) (R_{I_p})}{I_p + \sum_{a=0}^{a=t} I_a (1+gI_a)^{t-a}} + \frac{\sum_{a=0}^{a=t} I_a (1+gI_a)^{t-a} \cdot R_{I_a} (1+gR_{I_a})^{t-a}}{I_p + \sum_{a=0}^{a=t} I_a (1+gI_a)^{t-a}} \right]$$

For a particular conglomerate company under scrutiny, it is possible that all of the variables in the preceding equation could be known except k. Accordingly, for purposes of analysis, k could be treated as the dependent variable. If k were equal to or less than one, then the net effect on R_t of the following factors was zero or negative during the time period under consideration:

- (1) Divergences in gI_a and gR_{I_a} from the trend which existed immediately prior to acquisition;
- (2) Synergy release; and
- (3) Internal expansion of the parent company.

The main significance of "k" is that if it can be determined that during a time period a conglomerate company experienced a "k" equal to or less than one while, at the same time, its "R_t" increased, the only source of growth was through acquisition. Stated differently, if "k" is equal to or less than one, the parent company added no value to the subsidiaries that it acquired during the period--in spite of the fact that "R_t" increased for the conglomerate. A conglomerate company with a "k" equal to or less than one which has an increasing "R_t" is deriving the increases by virtue of its acquiring subsidiaries which have progressively greater effects on "R_t" and not because it is adding value to them.

Value Added by Company M

Company M, whose acquisition policies were examined in the preceding chapter, is an example of a company which added no value to its subsidiaries but was able to show an increasing R_t. For Company M, k equals 1, and

$$R_t = \frac{(I_p)(R_{I_p})}{I_p + \sum_{a=0}^{a=t} I_a(1+gI_a)^{t-a}} + \frac{\sum_{a=0}^{a=t} I_a(1+gI_a)^{t-a} \cdot R_{I_a}(1+gR_{I_a})^{t-a}}{I_p + \sum_{a=0}^{a=t} I_a(1+gI_a)^{t-a}}$$

In other words, Company M is a parent company which has no internal expansion influencing R_t, no synergy release, and no change in R_t is derived from its subsidiaries other than that which is projected. In spite of this, Company M was

able to show an increasing R_t while simultaneously acquiring companies with negative growth trends.

In the case of Company M, all of the increases in R_t which were derived can be attributed to the growth rates implicit in the parent and subsidiaries prior to acquisition and the relative sizes of acquisitions. In other words, the parent company did not add any operating value to the subsidiaries, in spite of the fact that the subsidiaries alone would have reported a declining growth rate.

In the following chapter, a selected group of conglomerate companies are examined, and an attempt is made to estimate the "k" associated with each of them during a time period. Hypothesis number one, which was presented in an earlier chapter, suggests that the "k's" will, on the average, be negative. Hypothesis number two suggests that the growth in "k" from year to year is negative as size and diversification increase.

Due to problem areas surrounding analysis of conglomerate companies, several additional modifications are made to "value added," defined in this chapter. The nature of these problems and changes imposed by them are examined in the next chapter prior to testing the hypotheses.

CHAPTER VII

RECOGNITION OF PROBLEM AREAS AND TESTING OF THE HYPOTHESES

In an earlier chapter the following problem areas were mentioned as being factors inhibiting analysis of conglomerate companies:

(1) The lumping together of operating and acquisition income.

(2) The absence of established earnings trends under the various economic conditions.

(3) The data regarding financial performance is generally reported only on a consolidated basis.

(4) The lack of uniformity of accounting methods between conglomerate companies and before and after merger of firms into a single conglomerate.

(5) Lack of comparability of operating circumstances before and after merger.

(6) The presence of diversification of earnings due to multi-industry orientation.

If conglomerate companies are examined in terms of the performance of subsidiaries prior to acquisition relative to postacquisition, at least some of the difficulties created by problem areas one and three can be eliminated. That is,

if conclusions about conglomerates are based on a concept of "value added" after acquisition, it does not matter that operating income and acquisition income are lumped together, and it does not matter that data is provided only on a consolidated basis, so long as adequate data can be determined for companies prior to their acquisition and for the combined parent and subsidiaries in subsequent time periods.

In order to implement the expected present value model, it is necessary to have financial data provided on the basis of groups of resources whose operating income potential responds similarly to specific changes in external conditions. In so far as this is true, the consolidation of income in financial reports represents a significant limitation. Since more detailed data is provided on the 10-K reports sent to the Securities and Exchange Commission, it is possible that reference to these reports can yield better results. However, the 10-K reports fall short of actual requirements.

Problem area five, the lack of comparability of operating circumstances before and after merger, makes it difficult or impossible to rely on accounting data to draw conclusions about efficiency of resource utilization before and after merger. For example, the parent company's bargaining position may enable the newly acquired subsidiary to maintain a stronger position relative to outside parties, such as suppliers, which will be reflected in increased profitability.

Also, the pricing policy that might be imposed by the parent company on its subsidiary could have an effect on income streams generated after acquisition. For reasons such as these, reliance on accounting data to draw conclusions about efficiency in "real" terms is questionable. Accordingly, to partially avoid this limitation, the viewpoint of an investor has been assumed throughout this discussion, and when reference is made to changes in efficiency, it is a change in income potential only--with no implication intended regarding efficiency of resource utilization.

Problem area four, the lack of uniformity of accounting methods, imposes probably the greatest constraint of all on an individual's ability to draw valid conclusions about conglomerate companies. Since the major independent variables being analyzed are financial ones, and since some degree of variance can exist in accounting valuations of transactions, it is customary for analysts and others engaged in financial investigations to make certain adjustments in published financial statements. However, in the case of conglomerate companies, there is more than one source of accounting difficulties. Not only are traditional accounting procedures a limiting factor, but, also, there is no general agreement about what information should be furnished to those interested in conglomerate companies.

Studies have been conducted and others are in progress regarding the form and procedures which should be followed

in reporting to investors and potential investors who are interested in conglomerate companies. Probably the most noteworthy and most recent of such studies was the one conducted by Robert K. Mautz for the Financial Executives Research Foundation. This study was largely devoted to a survey of various individuals' opinions about what changes in reporting methods should be made to make financial reporting for conglomerate companies more meaningful. In a questionnaire sent to a large number of analysts, the following objectives and criteria for analysis were recommended:

The investors' questionnaires indicate that analysts rate "maximum return in the long run from a combination of dividends and capital appreciation" as the most important objectives for those responding to the questionnaire.

The most important company characteristic in attaining these objectives are indicated as growth potential, managerial ability, and profitability, in that order.

The return on common stock equity, return on total assets and ratio of net income to sales were rated as the most useful indicators of profitability.

The preferred indicators of growth potential are growth of major markets, rate of growth in earnings per share, and research and development expenditures.

Managerial ability is best indicated by the growth of the company, the return on common stock equity, and the personal reputation of key personnel.¹

¹Robert K. Mautz, "Findings and Recommendations Released on Financial Executives Research Study," Financial Executive, XXXVI (February, 1968), p. 53.

In the preceding recommendations, most of the criteria and characteristics suggested for measuring the ability of conglomerate companies to attain the goals of "maximum return" were characteristics and criteria descriptive of companies already in a position of satisfying the goals of its stockholders. That is, the criteria and characteristics recommended were not decision criteria, but identification criteria. For example, it does not require a chartered analyst to determine that profitability is normally synonymous with a favorable rate of return. Such criteria amount to little more than an exercise in semantics, in which one effect is restated in terms of another. The chain of circular reasoning was completed when, in the last section of the recommendations, return on common stock equity was deemed a good indicator of managerial ability--that is, suggesting that the effect (favorable return) is an indicator of one of the causes (managerial ability). Such statements are quite true, but they do not deliver much information for investors' decision-making purposes.

Probably one of the major reasons for the unrewarding results of the forementioned survey is that the persons being surveyed did not have any preconceived notion regarding what use they would make of any information after it was provided. In order to know what information was needed, the persons being surveyed would need to know in advance what use would be made of it.

The results of Mautz's survey should not be totally unexpected since it is a "chicken or the egg" type of problem. That is, appropriate data cannot be generated, or even defined, before an appropriate theory of value is defined; and an appropriate theory of value cannot be implemented without appropriate data. Thus, unless a generally accepted theory of value for valuing conglomerate companies is available, then no survey can be conducted which will lead to unequivocal conclusions.

Since no generally accepted theory of value has been developed for valuing traditional types of companies, it is doubtful that such a theory is imminent regarding conglomerates; however, it is hoped that the theory of value presented earlier and implemented in the last chapter is at least indicative of possible theories which could be adopted. If nothing else, perhaps the nature of the problem will be illuminated.

Data Required for Valuing Conglomerates According to the Value Added Criterion

Since one of the major sources of confusion regarding conglomerates is their ability to obtain income from both operating sources and through acquisitions, it follows that a desired outcome from the accounting data would be a reliable presentation of the total operating trend broken down into acquisition and operating components. Ideally, such information would enable investors to make reasonable

projections of future values for these two components of income. However, since the past is the only guide to the future, a reasonable presentation of historical data is the best that can be expected. The historical data might be broken down meaningfully into categories such as the following:

(1) A statement of the company's acquisition strategy in terms of relative values for E_p , T_{es} , E_g , g_p , g_s , trend in size and rate of acquisitions along with supporting financial information.

(2) A discussion of the sources of value added by the parent company to the subsidiaries it has acquired, along with a comparison of the rate of return on investment which occurred after acquisition with that which would have occurred if the subsidiaries and parent had not been combined.

(3) A statement of the estimated operating trend if no acquisitions are made.

(4) A statement of the company's policy, if any, regarding changes in accounting methods which affect the computation of income and rate of return on investment received from a subsidiary after it is acquired.

While the suggestions on the preceding page and above regarding the information needs of investors are not necessarily complete or final, such information would facilitate the making of informed projections of operating and acquisition income. Unfortunately, the information is not

currently being provided, and the attainment of valid inferences about such companies is made difficult because of it. Obviously, the conclusions that can be drawn cannot be more comprehensive and more valid than the data upon which they are based.

Modifications to the Concept of "Value Added"
Imposed by the Forementioned Problem Areas

In the preceding chapter, negative value added was defined as occurring anytime the "k" in the following equation was equal to or less than one:

$$R_t = K (\text{Term A}' + \text{Term B}')$$

where

$$\text{Term A}' = \frac{(I_p) (R_{I_p})}{I_p + \sum_{a=0}^{a=t} I_a (1+g_{I_a})^{t-k}}$$

and

$$\text{Term B}' = \frac{\sum_{a=0}^{a=t} I_a (1+g_{I_a})^{t-a} \cdot R_{I_a} (1+g_{R_{I_a}})^{t-a}}{I_p + \sum_{a=0}^{a=t} I_a (1+g_{I_a})^{t-a}}$$

If "k" is less than one, then the collective contribution to rate of return on investment by the following sources is negative:

- (1) From internal expansion of the parent company
- (2) From divergences from the operating trend implied by the subsidiaries prior to acquisition

(3) From synergy release.

To help clarify further the nature of "value added," and to implement the discussion in a more felicitous manner, let attention be directed to the time periods described below. The three time periods represent the growth periods of subsidiaries prior to their acquisition, the period of acquisition by a parent conglomerate, and an investment period in shares of the conglomerate by an investor, respectively.

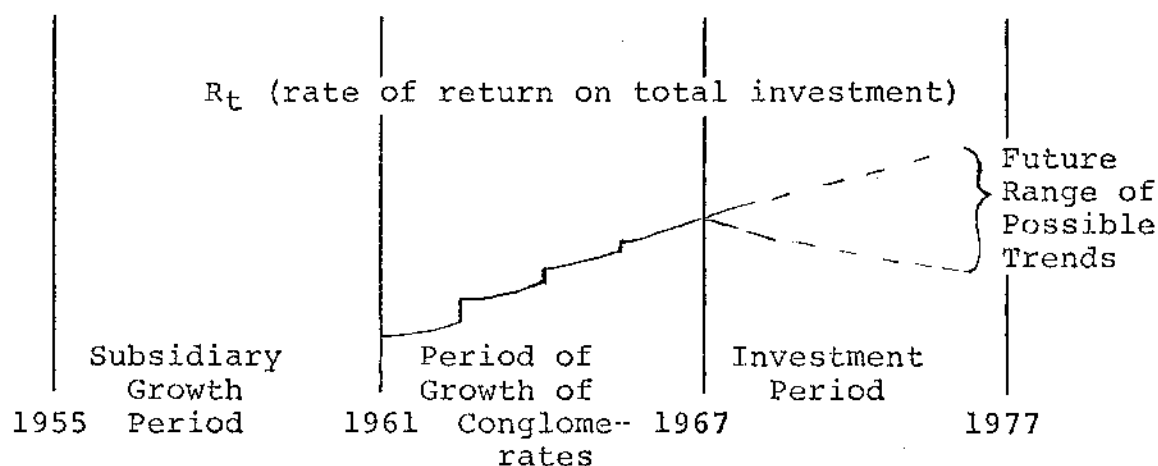


Fig. 27--Relevant time periods in the determination of "value added."

If "k" is less than one during the 1961-1967 period, then relative to the trend developed by the subsidiaries acquired (which could extend back to the 1955-1961 period) and relative to the rate of return of the parent company at the beginning of 1961, the net contribution to efficiency of investment (measured in terms of rate of return on investment) of the three sources of income listed on the preceding page is negative.

Ideally, all of the subsidiaries acquired by the parent company during the 1961-1967 period would be considered in determining whether or not value was added--i.e., whether or not "k" was greater or less than one; however, since conglomerate companies acquire both public and nonpublic subsidiaries and since information is available only for publicly owned companies prior to their acquisition, it is not possible or feasible to give recognition to all of the companies acquired.

As an alternative to recognition of all the subsidiaries acquired by a parent company, it is possible to state the conclusions about "value added," relative to certain groups of subsidiaries. In anticipation of this contingency, the hypotheses presented earlier were stated in terms of "value added" to the publicly owned subsidiaries only. That is, a universe for testing the hypotheses was defined such that only those conglomerates acquiring the highest proportion of publicly owned subsidiaries would be included--publicly owned prior to acquisition. Also, the conclusions about "value added" are relative only to the publicly owned subsidiaries.

In the following equation,

$$R_t = k \left[\frac{(I_p)(R_{I_p}) + \sum_{a=0}^{a=t} I_a (1+gI_a)^{t-a} R_{I_a} (1+gRI_a)^{t-a}}{I_p + \sum_{a=0}^{a=k} I_a (1+gI_a)^{t-a}} \right]$$

if "k" is less than one, and if the subsidiaries considered

are limited only to those publicly owned prior to acquisition, then the changes in R_t attributable to the following sources of income are negative:

- (1) Synergy
- (2) Divergences from projected growth trends of the publicly owned subsidiaries
- (3) Internal expansion of the parent company
- (4) Internal expansion and acquisitions of nonpublic subsidiaries.

In other words, from the publicly owned subsidiaries' point of view, the influence of the above sources of income on rate of return on investment has been negative if "value added" is negative.

To place the idea of "value added" into a more meaningful perspective, it is possible to conceive of all of the publicly owned subsidiaries as a single unit with a single spokesman. If the spokesman demanded that the conglomerate company maintain an efficiency of investment (either through its internal expansion or through its acquisitions) which was greater than that which would have occurred if the public subsidiaries and initial parent had remained unchanged, then he is demanding that the parent company add value to the publicly owned subsidiaries.

"Value Added" from Stockholders
Point of View

One basic assumption underlying the hypotheses to be tested is that "value added" is best measured relative to changes in rate of return on investment before and after acquisition. The propriety of rate of return on investment as a measure of "value added" is not an issue--since it is an assumption; however, one point demands clarification--namely, whether the calculation of "value added" should be based on a before-tax or after-tax rate of return.

If attention is directed to before-tax rate of return and "k" is negative, then the net contribution of "value added" of the following sources (from the publicly owned subsidiaries' point of view) is negative:

- (1) Synergy
- (2) Divergences from projected growth trends of the publicly owned subsidiaries
- (3) Internal expansion of the parent company
- (4) Internal expansion and acquisitions of nonpublicly owned subsidiaries.

If attention is shifted from a before-tax to an after-tax rate of return on investment, then the effects of changes in tax rates, debt-equity ratios, and debt charges also are influential in determining whether or not "value" is added. That is, if fixed charges per unit of investment rise after acquisition, then they will contribute in a negative manner to "value added."

The following is an expression for rate of return on investment after taxes (where R_{tx} refers to return after tax):

$$\frac{(1-T) [(R_t)(I_t) - (R_d)(D)]}{I_t} = R_{tx}$$

or

$$(1-T) [(R_t) - (R_d) \left(\frac{D}{I_t}\right)] = R_{tx}$$

. Also,

T = Tax Rate

R_t = Rate of Return on Investment

I_t = Total Investment

R_d = Rate Paid to Debt

D = Total Debt

The preceding equations indicate that changes in T, R_d , and $\frac{D}{I_t}$ cause R_{tx} to be different from R_t . Thus, as previously noted, if attention is shifted to rate of return on investment after taxes, then changes in tax rates, rate of debt charges, and debt-equity ratios are also factors influencing the result. If these changes are referred to as leverage changes, and if no value is added to its publicly owned subsidiaries by a conglomerate company, the collective effect on R_{tx} of the following sources is negative:

- (1) Synergy
- (2) Divergences from projected growth trends of the publicly owned subsidiaries
- (3) Internal expansion of the parent company

(4) Internal expansion and acquisitions of nonpublicly owned subsidiaries

(5) Leverage changes.

Since a sizeable portion of the data available provides only income data after taxes, after-tax rate of return is used in testing the hypotheses. Accordingly, calculations of "value added" are influenced by changes in all five of the forementioned variables.

Testing the Hypotheses

In this section of the paper, a selected group of conglomerate companies is examined. For each of the companies included, the following sets of information are desired:

(1) Whether or not "value added" to the publicly owned subsidiaries is positive or negative,

(2) The trend in k as size and diversification have increased,

(3) Whether or not the R_{Ia} 's of the publicly owned subsidiaries have been consistently higher than the R_t of the period prior to the one in which they were acquired (If this is true the implication is that acquisition income may have been one of the major motives of the parent.),

(4) The acquisition strategy of the company in terms of the ratios $\frac{R_{Ia}}{R_t}$ and $\frac{gR_{Ia}}{gR_t}$ for the public subsidiaries,

(5) The total trend in rate of return on investment from both acquisition income and operating income as a

percent of investment (This trend is used to make future projections of earnings per share, which, in turn, allows values to be placed on the shares.),

If the hypotheses presented earlier are correct, then "value added" to the publicly owned subsidiaries will tend to be negative. Also, "value added" will tend to decline as size and diversification have increased--i.e., "k" will become more and more negative. If acquisitions have been the major source of income to conglomerate companies, then the R_{Ia} 's would be expected to be consistently higher than the R_t 's of the prior period, and an upward trend in R_{Ia} 's would not be entirely unexpected. If hypothesis four is correct, then the companies with relatively similar patterns of "value added" will tend to have similar acquisition strategies--where such strategies are defined in terms of the ratios of $\frac{R_{Ia}}{R_{It}}$ and $\frac{gR_{Ia}}{gR_{It}}$. Finally, if hypothesis number three is correct, then, on the basis of the same operating trend and the same acquisition trend, and if an 8 percent rate of return is demanded, the current market value of the stocks of the conglomerate companies is too high.

Teledyne Company

The first company to be examined is Teledyne Company. This company, like most of the other conglomerates, is experiencing its greatest growth in the decade of the 1960's. The company's total assets in 1962 were slightly over 10.5

million, but by 1966 its assets were over 170 million.² Obviously, the company had experienced a considerable growth in the interim period. Also, the company's rate of return on investment after taxes climbed from 3.05 percent in 1962 to 7.06 percent in 1966. Of course, this growth trend can be attributed to some combination of both operating and acquisition income. Since expansion can be achieved more rapidly through external avenues than through internal avenues, the rapid growth in total assets of Teledyne is perhaps indicative of the major source of its growth.

The publicly owned companies upon which the calculation of "value added" is based are Kinetics Corporation, Hydra Power Corporation, Micro Wave Electronics, Geotechnical Corporation, Servomechanisms, United Electro Dynamics, Dubrow Electronics Industries, and Sprague Engineering. All of the companies were acquired by the parent company in the period 1962-1966. Before examining the financial data of these companies, some of the financial characteristics of Teledyne are summarized in Table V on the following page.

Summary of the Performance of Teledyne

Since the R_t for Teledyne in the period 1963-1966 was greater than that which would have occurred if the initial parent (in 1962) and the publicly owned acquisitions had remained unchanged, value was added. The fact that value

²See Table V, p. 161.

TABLE V
FINANCIAL CHARACTERISTICS OF TELEDYNE INCORPORATED

Year	I_t Investment	R_t Rate of Return	P Number of Preferred	R_p Return to Preferred	M Minority Interest	R_m Return to Minority	S Shares C. Stock
1966	170.4 $\times 10^6$	7.06%	624,000	\$3.50	none	none	2.74 \times 10 ⁶
Change							
1965	66.5 $\times 10^6$	5.64%	72,000	1.00	none	none	1.84 \times 10 ⁶
Change							
1964	47.4 $\times 10^6$	5.36%	74,156	1.00	none	none	1.05 \times 10 ⁶
Change							
1963	23.9 $\times 10^6$	5.35%	92,827	1.00	none	none	.840 \times 10 ⁶
Change							
1962	10.8 $\times 10^6$	3.05%	N.A.	N.A.	none	none	.646 \times 10 ⁶
Change							
1961							
Change							
1960							

Source: Moody's Industrial Manuals

was added is reflected in the values for "k" which are presented in the following pages. If the viewpoint of all the subsidiaries had been taken, instead of just the publicly owned ones, it is possible that a different result could have been attained.

TABLE VI
ACQUISITIONS OF PUBLICLY OWNED COMPANIES
USED IN DETERMINING "VALUE ADDED"

Year	Kinetics Corp., acquired in 1966		Hydra Power Corp., acquired in 1965		Micro Wave Electronics, acquired in 1965	
	I _a	R _{Ia}	I _a	R _{Ia}	I _a	R _{Ia}
1965	1.38×10 ⁶	13.56%	...	...	...	...
1964	1.38×10 ⁶	8.32%	2.80×10 ⁶	8.11%	2.61×10 ⁶	10.79%
1963	1.27×10 ⁶	7.91%	2.19×10 ⁶	7.35%	2.03×10 ⁶	16.97%
1962	2.27×10 ⁶	3.32%	2.08×10 ⁶	5.48%	1.71×10 ⁶	11.43%
1961	2.10×10 ⁶	3.21%	2.08×10 ⁶	-1.85%	.701×10 ⁶	25.97%
1961	...	...	2.00×10 ⁶	4.39%	N.A.	N.A.
	Geotechnical Corp., acquired in 1965		Servomechanisms, acquired in 1964		United Electro Dynamics acquired in 1964	
	I _a	R _{Ia}	I _a	R _{Ia}	I _a	R _{Ia}
1964	4.74×10 ⁶	8.19%	...	...	...	...
1963	4.66×10 ⁶	6.49%	3.52×10 ⁶	-14.72%	7.28×10 ⁶	8.76%
1962	4.85×10 ⁶	9.41%	5.04×10 ⁶	- 3.89%	7.63×10 ⁶	3.85%
1961	3.73×10 ⁶	9.64%	6.63×10 ⁶	7.76%	6.89×10 ⁶	5.48%
1960	N.A.	N.A.	7.46×10 ⁶	-12.99%	5.66×10 ⁶	7.68%
1959	...	...	9.22×10 ⁶	- 2.11%	2.77×10 ⁶	5.09%

Source: Moody's Industrial Manuals

TABLE VI--Continued

Year	McCormick Selph Associates, acquired in 1964		Dubrow Electronics Industries, acquired in 1964		Sprague Engineering, acquired in 1963	
	I_a	R_{Ia}	I_a	R_{Ia}	I_a	R_{Ia}
1963	1.27×10^6	10.45%	2.91×10^6	6.75%	...	...
1962	1.6×10^6	-7.70%	1.63×10^6	4.74%	3.95×10^6	3.88%
1961	N.A.	N.A.	1.14×10^6	7.46%	3.05×10^6	4.09%
1960	N.A.	N.A.	N.A.	N.A.	4.00×10^6	7.92%
1959	N.A.	N.A.	N.A.	N.A.	4.00×10^6	8.16%
1958	N.A.	N.A.	N.A.	N.A.	3.16×10^6	9.73%

As size and diversification increased, the value for "k" appeared to decline. A "least squares" trend line would indicate a slight decline in the rate at which value is added--i.e., the trend in "k"; accordingly, value added would appear to have declined as size and diversification increased.

It is interesting to note that the rate of return in the year of acquisition for every company considered was greater than the R_t of the prior period, except for Servomechanisms. The overwhelming implication of this is that acquisitions are designed to make immediate contributions to overall rate of return.

TABLE VII*

PROJECTIONS BASED ON TRENDS DEVELOPED
PRIOR TO ACQUISITION

Company	1963		1964	
	$I_t \times 10^6$	$(R_t) (I_t)$	$I_t \times 10^6$	$(I_t) (R_{I_k})$
Initial Parent (1962)	10.8×10^6	$.331 \times 10^6$	10.8×10^6	$.331 \times 10^6$
Sprague Engineering	3.82×10^6	$.0764 \times 10^6$	3.88×10^6	$.0167 \times 10^6$
Dubrow Electronics Industries	...	...	3.65×10^6	$.204 \times 10^6$
United Electro Dynamics	...	...	9.34×10^6	$.673 \times 10^6$
Servo-mechanisms	...	...	2.23×10^6	$.256 \times 10^6$
Micro Wave Electronics	...	...	...	...
Geotechnical Corporation	...	...	...	...
Hydra Power Corporation	...	...	...	...
Kinetics Corporation	...	...	...	...
Total	14.62	.407	29.90	1.48

*These data are derived from information contained in Tables V and VI.

TABLE VII--Continued

Company	1965		1966	
	$I_t \times 10^6$	$(R_t)(I_t)$	$I_t \times 10^6$	$(I_t)(R_{I_k})$
Initial Parent (1962)	10.8×10^6	$.331 \times 10^6$	10.8×10^6	$.331 \times 10^6$
Sprague Engineering	3.94×10^6	$-.0256 \times 10^6$	4.00×10^6	$-.10800$
Dubrow Electronics Industries	4.53×10^6	$.236 \times 10^6$	5.41×10^6	$.265 \times 10^6$
United Electro Dynamics	10.44×10^6	$.793 \times 10^6$	11.5×10^6	$.9085 \times 10^6$
Servo-mechanisms	$.85 \times 10^6$	$-.111 \times 10^6$	...	...
Micro Wave Electronics	3.26×10^6	$.205 \times 10^6$	3.86×10^6	$.0888 \times 10^6$
Geotechnical Corporation	5.20×10^6	$.345 \times 10^6$	5.49×10^6	$.325 \times 10^6$
Hydra Power Corporation	2.78×10^6	$.276 \times 10^6$	2.95×10^6	$.339 \times 10^6$
Kinetics Corporation	...	...	1.01×10^6	$.151 \times 10^6$
Total	41.80	2.05	46.17	2.30

The following values for K are based upon a "least squares" projection of the trends developed by the companies prior to their acquisition:

For 1963: $R_t = K(\text{Term A}' + \text{Term B}')$ or $5.35 = K(2.8)$

$$\underline{K = 1.9}$$

For 1964: $5.36 = K(4.9)$

$$\underline{K = 1.1}$$

For 1965: $5.64 = K(4.9)$

$$\underline{K = 1.2}$$

For 1966: $7.06 = K(4.1)$

$$\underline{K = 1.7}$$

The following are the equations for the "least square" trend lines for each of the companies acquired:

Kinetics Corporation: $R_{Ia} = 7.26 + 2.57t$ (t denotes time)

Hydra Power Corporation: $R_{Ia} = 4.87 + 1.66t$

Micro Wave Electronics: $R_{Ia} = 16.29 - 2.00t$

Geotechnical Corporation: $R_{Ia} = 8.44 - .36t$

Servomechanisms: $R_{Ia} = 6.74 - 1.6t$

United Electro Dynamics: $R_{Ia} = 6.17 + .35t$

Dubrow Electronics: $R_{Ia} = 6.31 - .36t$

Sprague Engineering: $R_{Ia} = 6.75 - 1.58t$

From the preceding equations, it can be observed that in five of the eight cases considered, the companies had developed negative trends in return on investment prior to the acquisition. If these negative trends are indicative of the operating trend for the overall company, the company is in a position of relying solely on acquisitions for its

growth. Whether this is the case or not cannot be determined from the data available. Recall that if the operating trend of overall company remains negative, earnings per share will eventually decline.

Earnings per share, denoted by Y_t , is expressed by the following equation:

$$Y_t = \frac{(R_{tx})(I_t) - (R_p)(P) - (R_m)(M)}{S}$$

In this equation, R_{tx} refers to after-tax rate of return on investment. The following is a summary of some of the independent variables in the equation for Teledyne and how they changed during the time period under consideration.

TABLE VIII
RATES OF CHANGE IN REAL VARIABLES FOR TELEDYNE

Time Period	Change in I_t	Change in R_{tx}	Change in $\frac{R_{tx}}{\text{Change in } I_t}$
1962-63	13.1×10^6	2.30%	$.175 \times 10^{-6}$
1963-64	23.5×10^6	.01%	$.0004 \times 10^{-6}$
1964-65	19.1×10^6	.28%	$.015 \times 10^{-6}$
1965-66	103.8×10^6	1.42%	$.0137 \times 10^{-6}$

From the preceding data it is apparent that I_t is growing rather dramatically, R_{tx} is increasing moderately, but growth rate as a percent of investment is declining.

That is, per unit of investment, the rate of return on investment is declining. As noted previously, it becomes harder and harder to increase R_t as size increases if a considerable part of growth is derived from acquisitions.

If R_{0X} is considered to be the initial rate of return on investment after taxes, then future values for R_{tX} can be defined in terms of change in I_t as

$$R_{tX} = [R_0 + \frac{\Delta R_t}{\Delta I_t} (I_t - I_0)]$$

In the preceding equation, I_0 denotes initial investment, and I_t denotes the future value for total investment. Also, $\frac{\Delta R_t}{\Delta I_t}$ denotes the rate of change of R_t with respect to I_t . In the next equation, I_t is expressed as a function of time:

$$I_t = [I_0 + \frac{\Delta I_t}{\Delta t} (t - t_0)]$$

Where

I_0 denotes initial investment

t_0 denotes initial point in time

t denotes future points in time

$\frac{\Delta I_t}{\Delta t}$ denotes rate of change of I_t with respect to time.

If the equation for I_t is substituted into the one for R_{tX} in the previous equation, then

$$R_{tX} = [R_{t_0} + (\frac{\Delta R_{tX}}{\Delta I_t}) (\frac{\Delta I_t}{\Delta t}) (t - t_0)]$$

If P is assumed to maintain a constant percentage relationship to I_t , then P as a function of investment is

$$P = \left(\frac{P_0}{I_0}\right) (I_t)$$

Likewise for minority interest and common stock of parent:

$$M = \frac{M_0}{I_0} (I_t)$$

and

$$S = \frac{S_0}{I_0} (I_t)$$

If the preceding equations for R_{tx} , P , M , and S are incorporated into the expression for Y_t , it becomes

$$Y_t = \frac{R_{t0} + \left(\frac{\Delta R_{tx}}{\Delta I_t}\right) \left(\frac{\Delta I_t}{\Delta t}\right) (t-t_0) - (R_p) \left(\frac{P_0}{I_0}\right) - (R_m) \left(\frac{M_0}{I_0}\right)}{\frac{S_0}{I_0}}$$

TABLE IX

VALUES FOR LEVERAGE VARIABLES FOR TELEDYNE

Year	$\frac{P}{I_t}$	R_p	R_m	$\frac{M}{I_t}$	$\frac{S}{I_t}$
1962	N.A.	1.00	none	none	.060
1963	3.9×10^{-3}	1.00	none	none	.036
1964	1.57×10^{-3}	1.00	none	none	.022
1965	1.08×10^{-3}	1.00	none	none	.027
1966	3.70×10^{-3}	3.50	none	none	.016

If both numerator and denominator are multiplied by I_0 , then the equation becomes

$$Y_t = \frac{(R_0)(I_0) + \left(\frac{\Delta R_{tx}}{\Delta I_t}\right) \left(\frac{\Delta I_t}{\Delta t}\right) (I_0)(t-t_0) - (R_p)(P_0) - (R_m)(M_0)}{S_0}$$

For Teledyne, if the variables with subscripts of "o" are considered to be values for 1966 and the rates of change are considered to be the average ones for the 1962-1966 period, then the equation reduces to

$$Y_t = 4.4 + 1.2 (t - t_0) - .8$$

Using this equation to project future values for Y_t

TABLE X
PRESENT VALUE OF EARNINGS OF TELEDYNE UNDER
CONDITIONS OF FUTURE CERTAINTY

Year	Earnings per Share	Present Value at 8%	Year	Earnings per Share	Present Value at 8%
1967	\$4.80	\$4.46	1972	\$10.80	\$6.80
1968	6.00	5.16	1973	12.00	6.96
1969	7.20	5.69	1974	13.20	7.13
1970	8.40	6.22	1975	14.40	7.20
1971	9.60	6.53	1976	15.60	7.17

Typically, Teledyne pays no cash dividends. Accordingly, for purposes of valuation, it is assumed that no dividends are paid and that the present value of the

common stock is derived from its sale after a ten-year holding period.

In 1966, the price-earnings multiple of Teledyne was around thirty-four.³ This rather high multiple was apparently predicated on the assumption that rapid increases in earnings per share would be sustained into the future. Since the growth of the company will likely decline in the future as acquisition income becomes less significant as a source of earnings per share, it is quite possible that a lower multiple of earnings would be more appropriate. Accordingly, the present values of the shares of Teledyne are calculated below at two different multiples--one multiple reflecting the present value if the same multiple prevails in 1976, and another reflecting an 8-percent-equivalent multiple.

TABLE XI
PRESENT VALUE OF SHARES OF TELEDYNE UNDER DIFFERENT
ASSUMED MULTIPLES OF EARNINGS

Price-Earnings Multiple	Price in 1976	Present Value at 8 Percent
$\frac{12.5}{1}$	\$195.00	\$90.28
$\frac{34}{1}$	536.40	248.17

³Moody's Handbook of Common Stocks, 1968, Moody's Investor Service, New York, 1968, p. 906.

If the $\frac{34}{1}$ price-earnings multiple is used to approximate the price which prevailed in early 1967, then a result of \$163.20 is derived. (Note that earnings per share reported by Teledyne in 1967 were \$2.12 per share, reflecting a 2 for 1 stock split and a stock dividend in 1967.⁴) Accordingly, the valuations on the preceding page correspond to the value of slightly more than two shares in 1967. On the basis of these values it would appear that the price of the shares in 1966 was low if a $\frac{34}{1}$ multiple is appropriate for 1976, and high if a $\frac{12.5}{1}$ multiple is assumed appropriate.

An indication of the acquisition strategy of Teledyne can possibly be derived by examining the values for the ratios reproduced below for the 1963-1966 period. In these ratios,

R_{I_a} --represents the "normalized" average rate of return on investment of all resources acquired externally during the designated year

R_{I_t} --represents the overall rate of return experienced in the prior year by the conglomerate company

gR_{I_a} --refers to the "normalized" average growth rates of rate of return on investment for all companies acquired in a particular year

gR_{I_t} --refers to the overall growth trend of the conglomerate during the period

The ratio of $\frac{gR_{I_a}}{gR_{I_t}}$ can be used to estimate the effects of acquisitions on the overall operating trend of the total company, and if the ratio of $\frac{R_{I_a}}{R_{I_t}}$ is greater than one, the

⁴Ibid., p. 905.

implication may be that the company is relying on acquisitions for a considerable part of its growth.

TABLE XII
OPERATING AND ACQUISITION RATIOS
FOR TELEDYNE COMPANY

	1963	1964	1965	1966
$\frac{R_{Ia}}{R_{It}}$	$\frac{2.01\%}{3.05\%}$	$\frac{.44\%}{5.35\%}$	$\frac{7.59\%}{5.36\%}$	$\frac{14.97\%}{5.64\%}$
$\frac{gR_{Ia}}{gR_{It}}$	$\frac{-1.58}{.50}$	$\frac{-.60}{.50}$	$\frac{.01}{.50}$	$\frac{2.57}{.50}$

The preceding ratios indicate that in two of the four years considered, Teledyne acquired companies whose normalized rates of return on investment were greater than the rate of return on investment of the overall company in the preceding year. Since the ratios for the two remaining years showed an opposite result, no clear inference can be made.

The second set of ratios is perhaps indicative of the effects of acquisitions on operating income. That is, in three of the four years considered, the growth trend in rate of return on investment was less than the normalized trend of the overall company. Perhaps the implication of these results is that Teledyne seeks to acquire companies whose overall operating growth trend is less than its own. Recall

that such companies are the ones which are generally the easiest to acquire with a favorable immediate effect on earnings per share.

Litton Industries

Litton, like all of the other conglomerates, has experienced dramatic growth in total resources employed during the 1960's. In 1960, its total assets were roughly 119 million.⁵ By the end of 1967, its total assets were in excess of 945 million.⁶ Accordingly, the company grew by nearly 800 percent during the time period under consideration. From 1960 to 1967, the rate of return on total investment rose from 6.3 percent to 7.4 percent.

The companies used in determining whether or not value was added include Hewitt-Robbins, Adler Electronics, Royal McBee Corporation, Clifton Precision Products Company, Fitchburg Paper Company, Stouffer Foods Corporation, Landis Tool Company, and Jefferson Electric Company. These companies were all acquired by Litton in the 1962-66 time period. The following is a summary of "value added" in each of the related years:

For 1963: K = 1.04

For 1964: K = 1.16

⁵Moody's Industrial Manual, Moody's Investor Service, New York, June, 1967, p. 3075.

⁶Moody's Industrial Manual, Moody's Investor Service, New York, June, 1968, p. 2651.

For 1965: $K = 1.15$

For 1966: $K = 1.06$

According to the preceding values for K , it appears that the overall rate of return experienced was greater than that which would have occurred if the initial parent and public subsidiaries had remained unchanged. Again, as in the case of Teledyne, it is possible that a different result would have been attained if all of the company's acquisitions instead of just the public ones had been considered.

While value was apparently added to the publicly owned subsidiaries, it appears that after 1964 the rate at which value was added began to decline. But, for the entire period under consideration, there was no substantial downward trend established for the rate at which value was added.

The acquisition policy of Litton, as indicated by the public acquisitions examined, is not clearly designed to make immediate increases in the overall rate of return. Only in four of the nine companies examined was the rate of return experienced by the newly acquired company greater than that for the combined company in the previous year. This result, however, does not imply that acquisitions were not conducted to make immediate contributions to earnings per share of the parent.

The following are the equations for the least square trend lines for each of the companies acquired:

Fitchburg Paper Company: $R_{Ia} = 4.7 + (.05)(t)$

Stouffer Foods Corporation:	$R_{Ia} = 7.2 + (.91) (t)$
Hewitt-Robbins Incorporated:	$R_{Ia} = 2.9 + (.16) (t)$
Adler Electronics:	$R_{Ia} = 3.6 + (2.0) (t)$
Royal McBee Corporation:	$R_{Ia} = 1.96 + (.45) (t)$
Clifton Precision Products:	$R_{Ia} = 10.06 + (.61) (t)$
Landis Tool Company:	$R_{Ia} = 14.1 + (1.5) (t)$
Jefferson Electric Company:	$R_{Ia} = 3.3 + (.46) (t)$

It would appear from the trend lines developed by the companies prior to their acquisition that Litton has been rather selective in its acquisitions. As compared to the experience of Teledyne, Litton has apparently concentrated on acquiring companies having positive growth trends. Of course, if all acquisitions instead of just the preceding ones had been considered, it is possible that a different picture of Litton's acquisition policy may have emerged.

Assuming that the company's growth per unit of investment continues at the same rate, and also assuming that the leverage position of the company remains the same in the future as it was in 1966, then the following is the related estimate for future levels of earnings per share:

$$Y_t = 2.62 + .19 (t-t_0) - .02$$

In 1966, the price per share of Litton's common stock fluctuated between an approximate range of \$56 per share and \$86 per share, while at the same time earnings per share were \$2.60,⁷ hence the company's stock was selling at

⁷Ibid., p. 2649

TABLE XIII
PRESENT VALUE OF STOCK OF LITTON UNDER
CONDITIONS OF FUTURE CERTAINTY

Year	Earnings per Share	Present Value at 8%
1967	\$2.79	\$2.58
1968	2.98	2.39
1969	3.17	2.35
1970	3.36	2.34
1971	3.55	2.28
1972	3.74	2.23
1973	3.93	2.16
1974	4.02	2.12
1975	4.21	2.01
1976	4.40	1.94

approximately twenty-five times current earnings. Assuming that this same multiple prevails in 1976, then the stock would sell for \$110 in that year. The present value of \$110 discounted back at 8 percent is \$47.30 in 1966.

As in the case of Teledyne, depending upon the price-earnings multiple which is assumed to exist in 1976, the stock can be made to appear over-valued or under-valued, as indicated in Table XIV.

TABLE XIV
PRESENT VALUE OF SHARES OF LITTON UNDER DIFFERENT
ASSUMED MULTIPLES OF EARNINGS

Price-Earnings Multiple	Price in 1976	Present Value at 8%
$\frac{5}{1}$	\$22.00	\$10.19
$\frac{12}{1}$	52.80	24.45
$\frac{25}{1}$	110.00	47.30

Summary of the Performance of Litton

Since the R_t for Litton in the period 1963-1966 was greater than that which would have occurred if the initial parent (in 1962) and the publicly owned acquisitions had remained unchanged, value was added. The fact that value was added is reflected in the values for K which were all greater than one. If the viewpoint of all the acquisitions had been taken, instead of just the publicly owned ones, it is possible that a different result could have been attained.

For the entire period (1962-1966) the value of K showed no distinct trend either upward or downward as size and diversification increased. However, after 1964 consecutive values for K began to decline.

With regard to the acquisition strategy implied by the types of publicly owned companies acquired, no clear attempt

by the parent company to raise its overall rate of return on investment can be inferred. Approximately one-half of the acquisitions had a favorable effect on R_t in the year of acquisition, and approximately one-half had an unfavorable effect. The following ratios perhaps hold a clue to the acquisition strategy of Litton.

TABLE XV
OPERATING AND ACQUISITION RATIOS FOR LITTON

	1963	1964	1965	1966
$\frac{R_{Ia}}{R_{It}}$	$\frac{8.5\%}{6.1\%}$	$\frac{3.7\%}{6.6\%}$	$\frac{3.3\%}{7.0\%}$	$\frac{10.7\%}{7.5\%}$
$\frac{gR_{Ia}}{gR_{It}}$	$\frac{.88}{.30}$	$\frac{.16}{.30}$	$\frac{.45}{.30}$	$\frac{.96}{.30}$

From the preceding ratios, it appears likely that the parent company attempts to acquire companies whose operating growth trend will contribute to the overall trend of the parent. This is evidenced by the fact that the ratio of $\frac{gR_{Ia}}{gR_{It}}$ is greater than one in every year except 1964. From the data used in this analysis, it is impossible to tell whether or not the parent company was able to acquire these companies without diluting earnings per share. It seems likely, however, that the parent company may have been able to use its relatively high P/E multiple to make acquisitions which

contributed positively to both operating income and acquisition income.

It is perhaps possible to state that the valuation of the common stock of Litton Company was too high in 1966 if an investor demanded an 8 percent rate of return. This conclusion rests on the valuation of \$47.30, derived earlier. That is, if the same amounts of income are derived in the future as in the past from both operating and acquisition sources, it is probable that the current valuation is too high.

Textron

Textron is generally considered to be one of the "synergistic" conglomerates. Like both Teledyne and Litton, this company has experienced a considerable growth in total assets employed during the 1960's. In 1962, this company's assets were valued at \$308,646,505.⁸ By 1967, reported book value of assets was \$669,575,000.⁹ During the period 1962 to 1967, the company's rate of return on total assets rose from 4.8 percent to 9.2 percent.

The acquisitions upon which the calculation of "value added" is based are Parkersburg Aetna Corporation, Jones & Lamson Machine Company, Sheaffer Pen Company, Bostitch

⁸Ibid., p. 1389.

⁹Ibid.

Company, and Gorham Corporation. The following represents the calculation of "value added":

For 1963: $K = 1.27$

For 1964: $K = 1.70$

For 1965: $K = 1.78$

For 1966: $K = 1.83$

For 1967: $K = 1.92$

On the basis of the preceding values for K, it appears that the overall rate of return experienced was greater than that which would have occurred if the initial parent and public subsidiaries had remained unchanged. The following are the equations for the least square trend lines for each of the companies acquired:

Gorham Corporation	$R_{Ia} = 3.94 + .59 (t)$
Bostitch Corporation	$R_{Ia} = 9.1 + .44 (t)$
Sheaffer Pen Company	$R_{Ia} = 3.74 - .47 (t)$
Jones & Lamson Company	$R_{Ia} = -1.05 - .50 (t)$
Parkersburg-Astna	$R_{Ia} = 3.98 + .41 (t)$

Based upon the preceding trends and the average growth rate for the parent company, the following ratios can be determined.

No clear inference regarding the acquisition strategy of Textron can be made from the ratios found in Table XVI. If the ratios are indicative of acquisition strategy, then it may be possible to state that acquisitions are not clearly designed to make immediate contributions to overall rate of

TABLE XVI
OPERATING AND ACQUISITION RATIOS FOR TEXTRON

	1963	1964	1965	1966	1967
$\frac{R_{Ia}}{R_{It}}$	$\frac{6.11\%}{4.80\%}$	$\frac{-4.55\%}{6.20\%}$	N.A.	$\frac{6.14\%}{7.80\%}$	$\frac{6.33\%}{8.80\%}$
$\frac{gR_{Ia}}{gR_{It}}$	$\frac{.41}{.88}$	$\frac{-.50}{.88}$	N.A.	$\frac{-.01}{.88}$	$\frac{.59}{.88}$

return on investment. Of the companies considered so far, Textron appears to be the one most likely to be relying on synergy for part of its growth.

Based upon the same growth rate experienced during the period 1962 to 1967--and assuming that the leverage variables remain around the average for the 1961 to 1967 period, then the following equation can be used to make estimates of future earnings per share:

$$Y_t = 2.33 + .25 (t-t_0) - .02$$

In 1967, after a two-for-one stock split, the price earnings multiple of the common stock of Textron was around nineteen to one.¹⁰ Also, the price range of the stock during 1967 was from a high of \$55 to a low of \$38.25.¹¹ Assuming that a fifteen-to-one multiple exists in 1977, then the

¹⁰Ibid., p. 1396.

¹¹Ibid.

TABLE XVII
PRESENT VALUE OF STOCK OF TEXTRON UNDER
CONDITIONS OF FUTURE CERTAINTY

Year	Earnings per Share	Present Value at 8%
1968	\$2.56	\$2.37
1969	2.81	2.41
1970	3.06	2.43
1971	3.31	2.43
1972	3.56	2.42
1973	3.81	2.40
1974	4.06	2.36
1975	4.31	2.33
1976	4.56	2.28
1977	4.81	2.23

common stock will be selling for \$72.15 if earnings in that year are \$4.81 per share. If there is no payout of earnings, the present value of revenues derived from sale of the stock in 1977 would be \$33.12.

Summary of the Performance of Textron

On the basis of the preceding analysis, it seems possible that Textron has added value to the subsidiaries it has acquired. To be certain, of course, all of the acquisitions instead of only the publicly owned ones would have

to be considered. Also, based upon the data available, value added would appear to have increased as size and diversification increased. Finally, based on the ratios of $\frac{RI_a}{RI_t}$ and $\frac{gRI_a}{gRI_t}$, no clear strategy can be inferred regarding Textron's acquisition strategy. Regarding the value of shares of Textron, it is possible that in 1967 the market price was overly optimistic if an 8-percent rate of return was demanded.

Walter Kidde and Company

This company has experienced rather dramatic growth in both rate of return on investment and total investment during the 1963-1967 period. In 1963, total assets were \$26,327,780, and rate of return on investment after taxes was 1.04 percent.¹² By 1967, total assets had risen to \$253,125,969,¹³ and rate of return on investment had risen to 7.00 percent. In 1967, price-earnings multiple was around twenty-four to one, perhaps reflecting the market's expectation that the same rate of growth was sustainable in the future.¹⁴

The companies used in the calculation of "value added" are M & D Store Fixtures, Pathe Equipment Company, Globe Security, Dura Corporation, Sargent Company, and Lighting Corporation of America. The following represents the calculation of value added:

¹²Moody's Industrial Manual, Moody's Investor Service, New York, 1964, p. 2745.

¹³Moody's Industrial Manual, Moody's Investor Service, New York, 1968, p. 2428.

¹⁴Ibid.

For 1964: $K = 1.00$

For 1965: $K = 1.09$

For 1966: $K = 1.08$

For 1967: $K = .96$

On the basis of the preceding values for K , it would appear that a slight amount of value, on the average, is being added to its acquisitions by Walter Kidde. However, it is doubtful that "value added" is the major source of the firm's growth.

The following are the equations for the least square trend lines for each of the companies acquired:

M & D Store Fixtures	$RI_a = 7.89 + .34 (t)$
Pathe Equipment Company	$RI_a = 15.57 + 1.18 (t)$
Lighting Corporation	$RI_a = 8.01 + 1.53 (t)$
Sargent & Company	$RI_a = 3.27 - .11 (t)$
Dura Corporation	$RI_a = 4.61 + 1.01 (t)$
Globe Security Company	$RI_a = 17.33 - .64 (t)$

Based upon the preceding trends and the average growth rate for the parent company, the ratios presented in Table XVIII were determined. If these ratios are indicative of the acquisitions strategy of Walter Kidde, then it would appear that acquisitions are designed to make an immediate contribution to the company's overall rate of return. The relative growth rates in rate of return on investment would indicate that perhaps the company is relying heavily on acquisitions and, to a lesser degree, on the operating trends of the companies it acquires.

TABLE XVIII
OPERATING AND ACQUISITION RATIOS FOR WALTER KIDDE

	1964	1965	1966	1967
$\frac{RI_a}{RI_t}$	N.A.	$\frac{15.11\%}{2.58\%}$	$\frac{11.20\%}{4.01\%}$	$\frac{8.40\%}{6.94\%}$
$\frac{gRI_a}{gRI_t}$	N.A.	$\frac{.76}{1.50}$	$\frac{.15}{1.50}$	$\frac{-.23}{1.50}$

Based upon the same growth rate experienced during the period 1962 to 1967, and assuming that the leverage variables remain the same as in 1967, then the following equation can be used to estimate future earnings per share: .

$$Y_t = 3.61 + .77 (t - t_0) - .41$$

It is questionable whether or not the company can maintain its current growth trend since its growth seems to be heavily oriented toward acquisition; accordingly, the use of the current earnings multiple of twenty-four-to-one may not be justified in the future. If this multiple is applied to projected earnings per share for 1977, then the price per share in that period would approximate \$250 per share. The present value of \$250 discounted back at 8 percent is \$115.50. If the value of the shares is assumed to be derived from the sale of the stock after ten years, then, since the price per share in 1967 was around \$73, it is possible that the shares are undervalued. The preceding valuation assumes that the

TABLE XIX

PRESENT VALUE OF THE COMMON STOCK OF WALTER KIDDE UNDER
CONDITIONS OF FUTURE UNCERTAINTY

Year	Earnings per Share	Present Value at 8%
1968	\$3.97	\$3.68
1969	4.74	4.06
1970	5.51	4.37
1971	6.28	4.62
1972	7.05	4.80
1973	7.82	4.93
1974	8.59	5.01
1975	9.36	5.05
1976	10.13	5.06
1977	10.90	5.05

same P/E multiple will prevail in the future as in 1967, and that the company can maintain the same average growth through both operating and acquisition sources in the future as in the past.

Summary of the Performance
of Walter Kidde

On the basis of the preceding analysis it would appear that the company is relying rather heavily on its acquisitions for growth, with very little or no value added subsequently. Also, based on the data available, it would appear that the

rate at which value was added began to decline after 1965. Finally, the current market price per share (in 1967) was low if the assumption was made that the company would continue to sustain its past growth trend.

Gulf and Western

Gulf and Western is a conglomerate which has shown its most significant growth in the past several years. In 1963, total assets employed were reported to be \$48,111,810.¹⁵ By 1967, total assets were \$749,437,236.¹⁶ Thus, in the period between 1963 and 1967, Gulf and Western multiplied the value of its assets by roughly nineteen times. During this same time period, the rate of return on total assets after taxes rose from 5.47 percent to 6.16 percent.

The acquisitions upon which the calculation of "value added" is based are New Jersey Zinc Company, Paramount Pictures, South Puerto Rico Sugar, North and Judd Company, Collyer Insulated Wire Company, Desilu Productions, and Universal America Company. The following represents the calculation of "value added":

1964: K = 1.00

1965: K = 1.09

1966: K = 1.27

1967: K = 1.01

¹⁵Moody's Industrial Manual, Moody's Investor Service, New York, 1964, p. 572.

¹⁶Moody's Industrial Manual, Moody's Investor Service, New York, 1968, p. 2735.

On the basis of the preceding values for K, it appears that the overall rate of return experienced was greater than that which would have occurred if the initial parent and public subsidiaries had remained unchanged.

The following are the equations for the least square trend lines for each of the companies acquired:

Universal American	$R_{Ia} = 4.56 + .87 (t)$
Desilu Productions	$R_{Ia} = 3.33 + .24 (t)$
Collyer Insulated Wire	$R_{Ia} = 2.14 + 1.19 (t)$
North and Judd Company	$R_{Ia} = 3.92 + .55 (t)$
South Puerto Rico Sugar	$R_{Ia} = 5.87 - .82 (t)$
Paramount Pictures	$R_{Ia} = 3.45 + 1.17 (t)$
New Jersey Zinc	$R_{Ia} = 2.23 + .83 (t)$

Based upon the preceding trends and the average growth rate for the parent company, the following ratios can be determined:

TABLE XX
OPERATING AND ACQUISITION RATIOS FOR GULF AND WESTERN

	1964	1965	1966	1967
$\frac{R_{Ia}}{R_{It}}$	N.A.	$\frac{4.72\%}{5.05\%}$	$\frac{5.19\%}{5.29\%}$	$\frac{6.20\%}{6.83\%}$
$\frac{gR_{Ia}}{gR_{It}}$	N.A.	$\frac{.82}{.17}$	$\frac{.18}{.17}$	$\frac{.71}{.17}$

If the preceding ratios are indicative of Gulf and Western's acquisition strategy, then it would appear that the companies acquired, on the average, tend to have about the same rate of return as the parent company in the preceding year. That is, the implication may be that the company seeks to acquire in such a manner so as not to dilute significantly its overall rate of return in the year of acquisition. By acquiring companies whose growth trends are greater than the average for all the overall company, Gulf and Western has apparently been able to report a rising operating growth trend.

Assuming that the company continues to increase its rate of return on investment, per unit of investment, at the same rate as in the immediate past (i.e., prior to 1967) and assuming that the leverage variables remain the same as in 1967, then the following equation can be used to make estimates of future earnings per share:

$$Y_t = 4.47 + .23 (t-t_0) - .74$$

The price-earnings multiple of Gulf and Western common stock has averaged around fourteen to one in recent periods. Assuming that this multiple is the appropriate one in 1977, and earnings in that year are \$6.03, then the present value of revenues from the sale of stock would be \$39.08 if an 8-percent rate of return is demanded.

TABLE XXI

PRESENT VALUE OF FUTURE DIVIDENDS OF GULF AND WESTERN
UNDER CONDITIONS OF FUTURE UNCERTAINTY

Year	Earnings per Share	Present Value at 8%
1968	\$3.96	\$3.67
1969	4.19	3.59
1970	4.42	3.51
1971	4.65	3.42
1972	4.88	3.32
1973	5.11	3.22
1974	5.34	3.11
1975	5.57	3.01
1976	5.80	2.90
1977	6.03	2.79

Summary of the Performance
of Gulf and Western

On the basis of the preceding analysis, it would appear that Gulf and Western has added value to its acquisitions. However, after 1966, as size and diversification increased, the rate at which value was added appears to have declined. With regard to the company's acquisition policy, it seems possible that acquisitions are designed to contribute to the growth rate of the overall company without diluting significantly the company's current rate of return on investment.

Finally, since the market price of the company's stock sold in late 1967 for around \$53 per share, the shares may be slightly over-valued.

Automatic Sprinkler Corporation of America

This company, like all of the others considered previously, has experienced a considerable growth in total assets during the 1960's. The company was incorporated in 1963, and in 1964 its assets were \$68,363,893.¹⁷ By the end of 1967, total assets had grown to \$158,135,000.¹⁸ During the same time interval, the net increase in rate of return on investment was from 5.13 percent in 1964 to 5.81 percent in 1967.

The companies upon which the calculation of value added is based are Baifield Industries, Scott Industries, Safeway Steel Products, and Interstate Engineering Company. The following represents the calculation of value added:

1965: $K = 1.00$

1966: $K = .79$

1967: $K = .54$

On the basis of the preceding values for K, it would appear that negative value was added, on the average, by the Automatic Sprinkler Corporation.

¹⁷Moody's Industrial Manual, Moody's Investor Service, New York, 1965, p. 1387.

¹⁸Moody's Industrial Manual, Moody's Investor Service, New York, 1968, p. 952.

The following are the least square trend lines for each of the companies acquired:

Baifield Industries	$R_{Ia} = 7.85 + 3.61 (t)$
Scott Industries	$R_{Ia} = 2.40 + 3.39 (t)$
Safeway Steel Products	$R_{Ia} = 6.16 + 1.09 (t)$
Interstate Engineering	$R_{Ia} = 11.44 - .50 (t)$

Based upon the preceding trends and the average growth rate for the parent company, the following ratios can be determined:

TABLE XXII
OPERATING AND ACQUISITION RATIOS FOR AUTOMATIC SPRINKLER

	1965	1966	1967
$\frac{R_{Ia}}{R_{It}}$	N.A.	$\frac{9.43\%}{9.28\%}$	$\frac{11.34\%}{7.41\%}$
$\frac{gR_{Ia}}{gR_{It}}$	N.A.	$\frac{1.09}{.009}$	$\frac{2.16}{.009}$

If the preceding ratios are indicative of the acquisition strategy of Automatic Sprinkler, then it would appear that the company has acquired companies which contribute to the overall operating growth trend of the company, as well as immediately because of acquisition. Based upon the same growth rate experienced during the period 1964 to 1967, and assuming that the leverage variables remain the same as in

1967, then the following equation can be used to estimate future earnings per share:

$$Y_t = 1.73 + .0025 (t - t_0) - .297$$

TABLE XXIII

PRESENT VALUE OF THE COMMON STOCK OF AUTOMATIC SPRINKLER
UNDER CONDITIONS OF FUTURE UNCERTAINTY

Year	Earnings per Share	Present Value at 8%
1968	\$1.43	\$1.33
1969	1.44	1.23
1970	1.44	1.14
1971	1.44	1.06
1972	1.45	.99
1973	1.45	.91
1974	1.45	.85
1975	1.45	.78
1976	1.46	.73
1977	1.46	.68

Assuming that the company shares are selling at approximately the same price earnings multiple in 1977 as in 1967, then the price will be roughly \$32 per share. The present value of \$32, discounted back at 8 percent is about \$15. Accordingly, if the present value is considered to be derived from sale of the stock in 1977, then the total present

value per share would appear to be about \$15. Since the company's stock is selling (in 1967) at a price higher than this amount, it is possible that the stock is over-valued.

Summary of the Performance of
Automatic Sprinkler

On the basis of the preceding analysis, it would appear that the company is adding negative value to its acquisitions. Also, it would appear that acquisitions are designed to add to both operating and acquisition income. Finally, it appears possible that the company's shares are over-valued.

CHAPTER VIII

SUMMARY AND CONCLUSIONS REGARDING "VALUE ADDED"

BY A SELECTED GROUP OF CONGLOMERATES

It was suggested in Chapter I that traditional valuation methods are not applicable to conglomerate companies for several reasons. Among these reasons was the consolidation of operating income and acquisition income in financial reporting--resulting in investor's inability to clearly discern which was the major source of growth. It was further suggested, by an illustration, that companies such as conglomerates could give the impression of being growth companies while, in reality, their actual productivity was declining.

It is possible to define several sources of growth which are available to companies which engage in extensive acquisition activity. Among these sources are

- (1) Size of acquisitions
- (2) Profitability of acquisitions
- (3) Rate of acquisitions
- (4) Synergy release
- (5) Internal expansion of income
- (6) Changes in the leverage position

Accordingly, earnings per share can be expected to change with a change in one or more of the preceding sources of growth.

Current methods used to value shares of stock in conglomerate companies generally do not give explicit recognition to all of the possible sources of growth listed on the preceding page. In fact, it is impossible to determine which of the categories of growth is primarily responsible for the dramatic performance of conglomerates. In an effort to help clarify the major sources of growth, a selected group of conglomerates were chosen, and their performance tested, relative to four hypotheses. These hypotheses are reproduced below.

Hypotheses

(1) Conglomerate companies listed on the New York and American stock exchanges acquiring the highest proportion of publicly owned subsidiaries in the period 1961-1967 have added negative value to them--where positive or negative value added is measured relative to the weighted average of the rates of return on book values of the resources employed by the subsidiary companies prior to their acquisition. Accordingly, negative value added is defined as the extent by which the projected rate of return on investment exceeds the rate actually experienced.

(2) The value added by conglomerate companies during the period 1961-1967 has tended to decrease from year to year as size and diversification have increased--where diversification is measured by the number of different industries in which resources are employed, and size is measured in terms of the book value of consolidated assets. (The decrease in value added can be from negative values to more negative values or from positive values to less positive values.)

(3) Based on a projection of past acquisition policies, past weighted average growth trends of parent and subsidiary companies, and the same percentage of value added by parent company organizations, the current market prices of the common stocks of conglomerate companies are too high if an 8 percent rate of return is demanded.

(4) If the conglomerate companies surveyed are grouped into (1) those adding the most value (relative to the other companies) and (2) those adding the least value, then the companies in each group will tend to have similar acquisition strategies. Acquisition strategies for this purpose are defined in terms of the relative rates of return and growth rates of subsidiaries and parent companies at the time of acquisition.

In Chapter VII, the hypotheses were tested. Value added was defined as occurring any time that K was greater than one--where K was the dependent variable in the following relationship:

$$R_t = K \left[\frac{(I_p) (R_{I_p})}{I_p + \sum_{a=0}^{a=t} I_a (1+g_{I_a})^{t-a}} + \frac{\sum_{a=0}^{a=t} I_a (1+g_{I_a})^{t-a} \cdot R_{I_a} (1+g_{R_{I_a}})^{t-a}}{I_p + \sum_{a=0}^{a=t} I_a (1+g_{I_a})^{t-a}} \right]$$

The variables were defined in the preceding equation such that any time K is less than one, the contribution of the following sources of income to rate of return on investment are negative:

- (1) Synergy release
- (2) Divergences from projected growth trends of the publicly owned subsidiaries
- (3) Internal expansion of the parent company
- (4) Internal expansion and acquisitions of nonpublicly owned subsidiaries
- (5) Leverage changes.

Accordingly, if K assumes a value of less than one, then the collective effect on rate of return on investment of the preceding variables is negative, and the only source of increases in rate of return on investment is through the company's acquisitions. Value added was defined as occurring anytime that K was greater than one.

Testing of Hypothesis One

The results of testing hypothesis number one were somewhat surprising. Of the companies surveyed, only two of them indicated negative value added in any of the years tested. Hence, the preliminary conclusion would be that for

the limited group of conglomerates examined, value was added. Such a conclusion cannot be extended generally to all conglomerates for several reasons. First, it is possible that the group selected is not indicative of all conglomerates. Second, since only the acquisitions which were publicly owned prior to their acquisition were considered, it is possible that a different conclusion would have resulted if nonpublic acquisitions had also been considered.

If, on the average, value added is positive, this means that, collectively, one or more of the following sources had a positive effect on rate of return on investment during the testing period:

- (1) Synergy release
- (2) Divergences from projected growth trends of the publicly owned subsidiaries
- (3) Internal expansion of the parent company
- (4) Internal expansion and acquisitions of nonpublicly owned subsidiaries
- (5) Leverage changes.

One major source of bias in testing for value added was the use of zero expansion rate for the initial parent. That is, it was assumed that g_{I_p} and $g_{R_{I_p}}$ were zero during the testing period.

In light of the closeness of K to a value of one in many of the cases considered, if it had been assumed that the initial parent had a small positive growth trend in operating

growth, probably almost all of the calculations would have shown a negative value for K. In fact, it would be possible to determine the internal growth rates of the initial parent which would be needed in order for value added to be negative. This could be done by setting K equal to one in the following equation and solving for sets of values of gI_p and gR_{I_p} which satisfied the equation.

$$R_t = K \left[\frac{I_p (1+gI_p)^t \cdot R_{I_p} (1+gR_{I_p})^t + \sum_{a=0}^{a=t} I_a (1+gI_a)^{t-a} \cdot R_{I_a} (1+gR_{I_a})^{t-a}}{I_p (1+gI_p)^t + \sum_{a=0}^{a=t} I_a (1+gI_a)^{t-a}} \right]$$

Using the equation above, the values for gI_p and gR_{I_p} could be determined which caused K to be equal to one. Accordingly, any values less than these would cause K to be less than one and value added would be negative.

Because "divergences from the trend developed prior to acquisition" is one of the variables which determines whether or not K is greater or less than one, several additional sources of bias are possibly introduced into the analysis. Specifically, it is possible that changes in accounting valuation methods could cause reported earnings and balance sheet valuations to be different before and after acquisition; also, changes in external operating conditions could cause the trends in operating performance to be different.

It was not practical, or possible, to correct for the deficiencies related to changes in accounting methods

because the corrections would require a knowledge of the methods used for all of the operating units and not just the publicly owned ones. That is, in the calculation of K, the trend in operating performance of the publicly owned subsidiaries which was developed prior to their acquisition is compared to that of the overall company after acquisition. In many cases, the companies acquired hundreds of smaller companies for which the data is unavailable. Even if the data were available, the time involved in making the corrections would not insure that the resulting data would be comparable. The data would not necessarily be comparable because changes in external conditions as well as changes in accounting methods can significantly influence the end result. To the extent that the external conditions which prevailed during the development of the operating trends of the subsidiaries prior to their acquisition is not necessarily the same as that which prevailed after acquisition, the validity and consistency of the results is diminished.

In summary, consistency of accounting methods and changes in external conditions represent two limitations implicit in the definition of value added which cannot be circumvented. Hence, it is possible that the positive values for K reflect favorable changes in business conditions during the 1961-1967 time period, or possibly, the positive values for K reflect changes in accounting valuation methods before and after acquisition, or finally, it is possible

that the favorable values for K reflect holding gains due to rising price levels.

Testing Hypothesis Two

Since generally both size and diversification increased with time for all of the conglomerate companies considered, the testing of hypothesis two amounts largely to an examination of what happened to the value of K for each of the companies during consecutive years of the testing period. Considering the experience of all of the companies together, the number of times that K increased from year to year was roughly the same as the number of times it decreased. Specifically, the ratio of increases to decreases was five to four. That is, for every five years in which an increase occurred in the rate at which value was added, there were four years in which declines occurred. Hence, for the conglomerate companies considered, value added apparently does not depend only upon size and degree of diversification.

Testing Hypothesis Three

The results of testing hypothesis number three are summarized in Table XXIV. The present values shown are the ones calculated in the preceding chapter. The other data regarding prices and earnings were taken from the sources indicated at the bottom of the table.

Based upon the data presented in Table XXIV and the assumptions implicit in the model used to project earnings

TABLE XXIV
COMPARISON OF PRESENT VALUE AND PRICE
IN THE YEAR OF VALUATION

Year	Name of Company	Approximate Price Range per Share	Median Price	Present Value
1966	Teledyne	\$133-\$50	\$91.50	\$248.00
1966	Litton	86- 56	71.00	47.30
1967	Textron	55- 25	40.00	33.12
1967	Walter Kidde	79- 44	61.50	115.50
1967	Gulf & Western	62- 29	45.50	39.08
1967	Automatic Sprinkler	75- 26	50.50	15.00

Sources: Moody's Industrial Manuals
Moody's Handbook of Common Stocks
Standard and Poor's Security Owner's Stock Guide

per share--as well as the assumption that the value of the shares of conglomerate companies are derived from sale of the stock after ten years--the shares of stock were over-valued in four of the six cases (where the median market price in the year of valuation is compared to the corresponding present value). Accordingly, depending upon the validity of the assumptions used in deriving the present values, it is possible that the common stocks of the companies considered were over-valued at the time of valuation.

Testing Hypothesis Four

The purpose of this hypothesis was to determine if any clear pattern existed in acquisition policy among the companies considered, and to determine if any patterns existed between value added and certain strategies. To begin with, no clear pattern in acquisition strategy was observed for the companies as a class (where acquisition strategies were assumed to be measured by relative values for $\frac{RI_a}{RI_t}$ and $\frac{gRI_a}{gRI_t}$). The ratio $\frac{RI_a}{RI_t}$ was greater than one exactly one-half of the time, and, likewise, the ratio of $\frac{gRI_a}{gRI_t}$ was greater than one exactly one-half of the time. Accordingly, for the companies considered, it cannot be concluded that they show any pattern, collectively, in their acquisition strategies.

Table XXV is useful for summarizing the results of testing for individual relationships between the ratio of $\frac{RI_a}{RI_t}$ and value added. Recall that one of the basic assumptions underlying the statement of hypothesis four was that companies with high values of $\frac{RI_a}{RI_t}$ would tend to have low amounts of value added because they were presumed to be concentrating on acquisitions rather than on operating efficiencies.

The results illustrated in Table XXV tend to support hypothesis four. That is, the companies whose ratios for $\frac{RI_a}{RI_t}$ tended to be greater than one were also the companies which had average values for K (value added) which were less than those experienced by companies in the other two categories.

TABLE XXV
VALUE ADDED AND ACQUISITION STRATEGIES

Companies Whose $\frac{R_{Ia}}{R_{It}}$ was Greater Than One Most of the Time	K*	Companies Whose $\frac{R_{Ia}}{R_{It}}$ Showed No Tendency to be Greater or Less Than One	K	Companies Whose $\frac{R_{Ia}}{R_{It}}$ was Less Than One Most of the Time	K
Walter Kidde	1.03	Teledyne	1.48	Textron	1.70
		Litton	1.10	Gulf and Western	1.09
		Automatic Sprinkler	.78		
Average K	1.03	Average K	1.12	Average K	1.39

*K represents the average values for the years examined.

Perhaps the implication of this result is that companies with relatively high ratios of $\frac{R_{Ia}}{R_{It}}$ are concentrating more on obtaining acquisition income and less on adding value to companies after their acquisition.

As shown in Table XXVI, those companies having ratios of $\frac{gR_{Ia}}{gR_{It}}$ which were greater than one tended to have values for K (value added) which were less than those for the companies whose $\frac{gR_{Ia}}{gR_{It}}$ ratios were less than one. Perhaps the implication of the latter set of results is that companies acquiring other companies with operating trends which are less than their overall trends are in a better position to add value to them than in other instances.

TABLE XXVI
VALUE ADDED AND ACQUISITION STRATEGIES

Companies Whose $\frac{gRIa}{gRIit}$ was Greater Than One Most of the Time	K*	Companies Whose $\frac{gRIa}{gRIit}$ Showed No Tendency to be Greater or Less Than One	K	Companies Whose $\frac{gRIa}{gRIit}$ was Less Than One Most of the Time	K
Gulf and Western	1.09	Automatic Sprinkler	.78	Teledyne	1.48
Litton	1.10			Walter Kidde	1.03
				Textron	1.70
Average K	1.09	Average K	.78	Average K	1.40

*K represents the average values for the years examined.

CHAPTER IX

VALUATION ACCORDING TO EXPECTED PRESENT VALUE

The purpose of this chapter is to outline and illustrate the implementation of the expected present value model. Recall that, for conglomerate companies, no long-run trends can be established which include periods of adverse business. That is, conglomerate companies are a relatively new phenomenon, having had their principal growth since the 1960-1961 recession. During this period, there has been a fairly constant external business environment in which sustained growth and inflation have been the major characteristics. A trend based upon the experience of conglomerates during the 1960's would, like other trends, be based upon the assumption that the future environment and business activities would, on the average, be a continuation of those which characterized the past.

One of the assumptions underlying the adoption of the expected present value model for valuing conglomerates is that the experience of the 1960's is not a fair indication of what can be expected in the future. Two major reasons can be cited for the inadequacy of the 1960's as an index of future performance. First, it is by no means a certainty that growth and inflation of the same average dimensions will

continue to dominate the economy. Second, given the same conditions in the future, it is doubtful that acquisition income can continue to be as significant a part of income since good merger candidates will become more and more scarce, and, for a given firm, sheer size demanded will eventually inhibit it.

For reasons such as those mentioned in the preceding paragraph, valuations based on a simple projection of past trends is not considered appropriate. As a replacement for making valuations on the basis of simple past trends, the expected present value model was introduced in an earlier chapter. The expected present value model does not rely on projections of the past, but, rather, on a simulation of future conditions and the effects of different conditions on earnings per share.

Instead of assuming that the growth trend developed in the past will continue in the future, the expected present value model allows for recognition of any number of trends considered possible. Each of the trend lines given recognition must be defined in terms of a particular slope, which corresponds to a different state of the world simulated. In addition to a trend line for each state of the world considered possible, a probability (Pr_n) must be defined in order to derive the related expected present value.

As noted previously, if an investor were capable of deriving perfect expectations of the effects of different

conditions on earnings per share, then trend lines representing different states of the world could be defined with accuracy. Also, an investor with perfect expectations would be able to derive accurate probabilities for each trend line. Of course, in reality, perfect expectations are extremely improbable.

Valuations in Terms of Expectations

While much issue can be taken with theories of value and decision models which demand that values for future states of the world be projected, the alternatives to these theories are even less desirable. That is, if it is assumed that reasonable values for future states of the world cannot be anticipated, then no intelligent decision is possible.

If one treats the independent variables in theories of value as expectations, then, in as much as expectations are real at the time of decision, it is possible that no issue can be taken with resultant valuations. In other words, if decisions and valuations are made in terms of expectations, it is not illogical to define value in terms of expectations. If this is done, a security would be considered to have value at the time of a decision, not because of its actual income potential, but because of the expectations of income assigned to it. This point of view is a departure from traditional analysis, which attempts to define value as something intrinsic in the security and not as an attribute of the person placing the value.

The traditional point of view seems to concentrate more heavily on the mechanics and models of the valuation process and less on relationships and assumptions underlying the specific models. Perhaps a more meaningful point of view would be to treat valuation processes as formalized methods for investors to place values on investments in terms of their own objectives and expectations about the investments. In other words, a valuation process can be thought of as a process in which an individual

- (1) defines and clarifies his investment objectives;
- (2) establishes a relationship between his objectives, alternatives, and states of the world; and
- (3) places values on alternative investments in terms of numerical values for objectives and in terms of expectations about states of the world.

While a valuation can be shown to be wrong after the fact, an investor not having the benefit of hindsight cannot expect to place values which are perfect in retrospect. If an investor performs steps one and two listed above in a reasonable manner, then the only limitations to his valuations would be those attributable to three. Limiting errors to imperfect expectations is probably adequate reason for conducting formalized valuation procedures; however, if values are defined as being derived from expectations, no issue can be taken with them at all. Or stated differently, given that the information, objectives, and assumptions of a particular investor are accurately incorporated into a

theory of value, then the valuations which result are the best ones possible.

Expected Present Value Model

The following equations can be used to define those variables which influence earnings per share of conglomerate companies; accordingly, they indicate which factors should be the dependent variables in a simulation of the effects of different states of the world on earnings per share.

$$Y_t = \frac{(1-T) [(R_t) (I_t) - (R_d) (D)] - (R_p) (P) - (R_m) (M)}{S}$$

When used for predicting future values for earnings per share, the R_t and I_t in the preceding equation depends upon current levels of operating income and on the size and growth trends derived from both future operating income and future acquisitions. If a subscript of "p" denotes both the parent company and subsidiaries held at a particular point in time, and "a" denotes average values for future acquisitions per year, then $(R_t) (I_t)$ can be expressed as

$$(R_t) (I_t) = I_p (1+g_{I_p})^t \cdot R_{I_p} (1+g_{R_{I_p}})^t + \sum_{t=0}^{t=n} I_a (1+g_{I_a})^t \cdot R_{I_a} (1+g_{R_{I_a}})^t$$

In this equation, the subscript "a" denotes average values per year for n years of acquisitions.

If the leverage variables D, P, and M are expressed as fractions of I_t , then the following are the variables which determine Y_t :

$$I_p, gI_p, R_{I_p}, gR_{I_p}, I_a, gI_a, R_{I_a}, gR_{I_a}$$

$$\frac{D}{I_t}, \frac{P}{I_t}, \frac{M}{I_t}, R_d, R_p, R_m, T, S, \text{ and } t$$

In the simulation of different states of the world on Y_t , the effects are translated through the variables listed above. That is, anyone wishing to evaluate the effects of changes in conditions must be able to evaluate the effects of such changes on the variables above. Once this is done, then Y_t can be determined since it is the dependent variable.

For purposes of discussion let it be assumed that the company being valued has resources employed in four distinct industries, and, furthermore, let it be assumed that each of these industries has a different sensitivity to changes in external conditions. (Presumably, one of the advantages of conglomerate companies over other forms is that they provide a degree of diversification not normally provided.)

Letting a subscript of one, two, three, and four denote values for each of the four industries, then, at any point in time,

$$I_p = I_{p1} + I_{p2} + I_{p3} + I_{p4}$$

and

$$R_{I_p} = \frac{(R_{I_{p1}})(I_{p1}) + (R_{I_{p2}})(I_{p2}) + (R_{I_{p3}})(I_{p3}) + (R_{I_{p4}})(I_{p4})}{I_p}$$

Each of the industry groups denoted with subscripts of one, two, three, or four in the preceding equation would have its own individual growth rates in both rate of return

on investment and total investment; furthermore, these rates would be expected to change with a given change in external conditions. Accordingly, the effects of changes in external circumstances on Y_t would be channeled through their effects on individual industries. Thus, if future expectations are to recognize the uniqueness of each operating area in which a conglomerate company has resources employed, then I_p , gI_p , R_{I_p} , and gR_{I_p} must be divided into various industry components.

For purposes of simulation, the components of future income are divided into

- (1) Gross income from parent and prior acquisitions
- (2) Gross income from future acquisitions
- (3) Changes in the levels of R_d , R_p , and R_m
- (4) Leverage changes reflected in T , $\frac{D}{I_t}$, $\frac{P}{I_t}$, $\frac{M}{I_t}$, and $\frac{S}{I_t}$.

In matrix form, a symbolic representation of the simulation model recognizing four possible states of the world might appear similar to that on the following page. The format of the matrix can be used to organize the steps to be followed in developing the simulation model according to the following pattern:

- (1) Simulation of future levels of gross operating income to be derived from parent and prior acquisitions
- (2) Simulation of future income to be derived from acquisitions
- (3) Simulation of changes in the levels of R_d , R_p , and R_m

Probability	.50	.17	.17	.16
State of the World	(1)	(2)	(3)	(4)
Conditional Gross Income from Future Acquisitions				
Conditional Gross Income from Parent and Prior Acquisitions	Industry:	Industry:	Industry:	Industry:
	1 | 2 | 3 | 4	1 | 2 | 3 | 4	1 | 2 | 3 | 4	1 | 2 | 3 | 4
Conditional Levels of R_d, R_p, R_m				
Conditional Levels of $T, \frac{D}{I_t}, \frac{P}{I_t}, \frac{M}{I_t},$ and $\frac{S}{I_t}$				
Conditional Earnings per Share				
Present Value of Conditional Earnings per Share (PV_n)				

$$E_{pv} = \sum_{n=1}^{n=4} (P_{rn}) (PV_n)$$

Fig. 28--Valuation Matrix under Conditions of Future Uncertainty.

- (4) Simulation of leverage changes reflected in values for T , $\frac{D}{I_t}$, $\frac{P}{I_t}$, $\frac{M}{I_t}$, and $\frac{S}{I_t}$.

Before actually attempting to simulate conditions according to the format above, it is probably important to point out certain problem areas and assumptions which must be considered. First of all, a simulation of the components of income is necessary because the values for the variables which determine earnings per share are assumed to be generated under conditions of future uncertainty. Accordingly, the individual placing the value must be able to specify his expectations in terms of probabilities. Presumably, such expectations would be based upon a consideration of all the factors which influence the particular variable being simulated--both internal and external to the company.

A second point worth noting is that the simulation period is assumed to be ten years; accordingly, the growth trends expressed in terms of probabilities will be average ones for a fairly long period of time, which logically would reflect expectations which were secular rather than cyclical or seasonal in nature. After expectations have been defined, then, in so far as the variables might be expected to move in direct relationships to one another, the possibility of "covariance" must be recognized.

Simulation of Future Operating Income from
Parent and Prior Acquisitions

If it is assumed that the company being analyzed has resources employed in four different industries whose growth rates and profitability are different, then the effects of changes in expectations must be specified for each company or operating group within a particular industry. The following definitions are a necessary starting point in this direction:

R_{p1} --current rate of return on investment of resources employed in industry number one

R_{p2} --current rate of return on investment of resources employed in industry number two

R_{p3} --current rate of return on investment of resources employed in industry number three

R_{p4} --current rate of return on investment of resources employed in industry number four

I_{p1} --current book value of resources employed in industry number one

I_{p2} --current book value of resources employed in industry number two

I_{p3} --current book value of resources employed in industry number three

I_{p4} --current book value of resources employed in industry number four

At the time valuation is to occur, it is assumed that the rates of return on investment in each of the four operating areas are known, along with the initial total investment in each of the operating areas. The unknown variables are future growth rates for rate of return on investment and

for rate of investment in each of the four operating areas. Obviously, such variables are subject to future uncertainty, and related expectations must be expressed in terms of probabilities.

Any number of approaches are possible for defining expectations about future growth rates. For example, if there are a large number of industries in which a particular company is operating, then it might be advisable to define overall expectations, such as for all nonfinancial corporations. Specifically, if it is assumed that in each of the four industries under consideration, the rate of investment moves in the same direction as changes in the overall rate, but with 110 percent of the overall rate in industry number one, in industry number two with 130 percent of the overall rate, and in industries three and four with 80 percent and 90 percent of the overall rate, respectively. Then, the following represents the generalized expectations for changes within each industry.

Industry Number	Expected Growth Rate of Internal Investment for each Industry as a Percent of Expectation for All Non-financial Corporations (g_{Inf})	
1	(1.10)	(g_{Inf})
2	(1.30)	(g_{Inf})
3	(0.80)	(g_{Inf})
4	(0.90)	(g_{Inf})

In a manner similar to that just described, relationships between overall expectations and expectations within single industries can be derived for rates of return on investment. Accordingly, if it is assumed that rate of return on investment in each of the industries responds in the same direction but with only 80 percent, 90 percent, 110 percent, and 70 percent of the magnitude, then changes in growth rates of rate of return on investment can be denoted for each industry as

Industry Number	Expected Growth Rate of Rate of Return on Investment as a Percent of Expectation for All Nonfinancial Corporations (gR_{Inf})
1	(0.80) (gR_{Inf})
2	(0.90) (gR_{Inf})
3	(1.10) (gR_{Inf})
4	(0.70) (gR_{Inf})

If the resources which the company has employed in the four industries are expected to perform at the same level as industry averages, then the changes in the forementioned variables for the industry averages can be used as the expectations for the specific sets of resources. On the other hand, if the individual operating groups are expected to do better or worse than the industry averages, then allowances must be made. For purposes of illustration, let it be assumed that the resources employed in each of the four

industries are characterized by the following expectations expressed as percentages of industry expectations.

Resource Group Number	Expected Growth Rate of Internal Investment as a Percent of Expectation for Industry
1	80%
2	115%
3	75%
4	90%

Resource Group Number	Expected Growth Rate of Rate of Return on Investment as a Percent of Expectation for Industry
1	50%
2	90%
3	110%
4	80%

Given the preceding assumptions, then the following are expressions for expected growth rates of investment and rates of return on investment for each of the four sets of resources which the company employs:

$$\begin{aligned}
 g_{Ip1} &= (.80)(1.10)g_{Inf} & g_{Rip1} &= (.50)(.80)g_{RInf} \\
 g_{Ip2} &= (1.15)(1.30)g_{Inf} & g_{Rip2} &= (.90)(.90)g_{RInf} \\
 g_{Ip3} &= (.75)(.80)g_{Inf} & g_{Rip3} &= (1.10)(1.10)g_{RInf} \\
 g_{Ip4} &= (.90)(.90)g_{Inf} & g_{Rip4} &= (.80)(.70)g_{RInf}
 \end{aligned}$$

In order to further develop the simulation model, let it be assumed that the values for rate of return on investment and total investment for resources employed in each of the industries are given by the following:¹

R_{Ip1} 10%	I_{p1} \$1,000,000
R_{Ip2} 20%	I_{p2} \$2,000,000
R_{Ip3} 20%	I_{p3} \$1,500,000
R_{Ip4} 12%	I_{p4} \$4,000,000

Given the initial values listed above, the expectations for future levels of operating income from each of the sets of resources employed are presented below in general terms:²

Income From
Industry Number

$$(1) = (.10) [1.01 + (.4)gR_{Inf}]^{10} \cdot (1 \times 10^6) [1.02 + (.8)gI_{nf}]^{10}$$

$$(2) = (.20) [.98 + (.81)gR_{Inf}]^{10} \cdot (2 \times 10^6) [.97 + (1.495)gI_{nf}]^{10}$$

$$(3) = (.20) [.99 + (1.21)gR_{Inf}]^{10} \cdot (1.5 \times 10^6) [1.02 + (.60)gI_{nf}]^{10}$$

$$(4) = (.12) [1.01 + (.56)gR_{Inf}]^{10} \cdot (4 \times 10^6) [1.01 + (.81)gI_{nf}]^{10}$$

Using these equations, a simulation of income patterns from various industries can be obtained by simulating the expected performance pattern for all nonfinancial corporations. The reference distribution--in this case the performance of all nonfinancial corporations--is something of an arbitrary

¹Note: The values above are values which exist at the time valuation is to occur and are assumed to be known by the individual attempting to make the valuation.

²Note: The simulation is for a ten-year period, which accounts for the exponents in the preceding expressions.

decision; however, this particular group was selected for purposes of illustration because past data is available and "covariance" relationships can be defined and supported more appropriately for this reason.

Defining Expectations for Nonfinancial Corporations

Since the expectations of growth for the resources employed by the company under consideration have been assumed to be related to overall expectations for all nonfinancial corporations, it follows that a simulation of possible growth trends for nonfinancial corporations is equivalent to a simulation of the growth trends for the groups of resources in question. The next task to be dealt with is a simulation of future possible growth patterns based upon the assumed relationship between specific resources and overall expectations for nonfinancial corporations.

As noted in an earlier chapter, the valuation of conglomerate companies is not a valuation in which the future states of the world can be assumed to be known with certainty. Accordingly, the recognition of future uncertainty was deemed imperative. Furthermore, since the process which is generating future states of the world seems to be most appropriately described as an imperfect one, a Bayesian approach was considered appropriate. In line with this reasoning, the person placing a value must be able to express expectations in terms of probabilities. While any number of

approaches are possible, the following one is recommended and is used for purposes of illustration.

First, since Bayesian decision theory relies on subjective expectations, the initial requirement for valuing shares in conglomerate companies is that all of the expectations for the variables influencing Y_t be expressed in terms of probability distributions. The first step in defining such expectations is a specification of the following for nonfinancial corporations:

- (1) The most likely growth rates for rate of return on investment and for rate of investment
- (2) The most optimistic expectation for growth rates
- (3) The least optimistic expectation for growth rates

In graphic form, the three expectations might appear similar to the following:

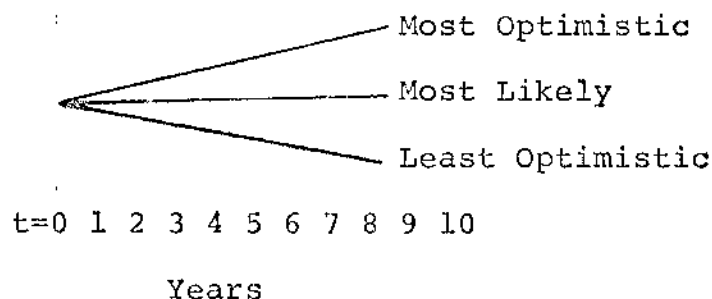


Fig. 29--Initial range of expectations

Each of the three trend lines presented above corresponds to a particular growth rate. The lines presented reflect linear growth trends; however, if it were felt to be

appropriate, the trend lines could be drawn to reflect geometric growth trends. Also, the three expectations--i.e., most likely, most optimistic, and least optimistic--would be expressed for both rate of return on investment and for total investment by all nonfinancial corporations.

The range between the most likely and the least likely expectations contains all expectations of growth which are considered as relevant possibilities; accordingly, the summation of the subjective probabilities for growth rates within this overall interval is one. After defining the range of possible expectations, the second recommended step is to bisect the angle between the most likely expectation and the most optimistic expectation and, also, to bisect the angle between the most likely expectation and the most pessimistic expectation. This second step is reflected in the following diagram.

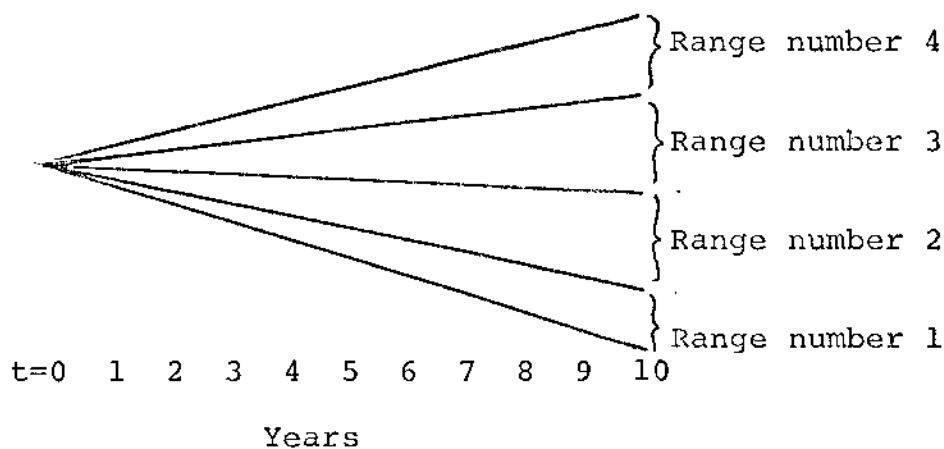


Fig. 30--Bisection of the initial range of expectations

By continuing to bisect angles in the manner just described, more and more intervals of expectations can be defined. For purposes of illustration only one bisection is performed and only four ranges of expectations are created. The class boundaries and class medians of these four intervals can be derived and expressed as different growth rates reflecting the slope of the line which defines the boundary. For example, if the most optimistic expectation for growth of rate of return on investment for all nonfinancial corporations is 10 percent, the least optimistic is -5 percent, and the most likely expectation is 7 percent; then, the following class boundaries and class medians are defined.

	Range (1)	Range (2)	Range (3)	Range (4)	
Class Median	-2%	4%	7.75%	9.25%	
Class Boundary	-5%	1%	7%	8.5%	10%

Fig. 31--Range of Expectations for Rate of Return on Investment for All Nonfinancial Corporations.

The next step which must be performed is a specification of the subjective probabilities related to the expectations contained within each class. For example, if the subjective probabilities for ranges 1, 2, 3, and 4 are estimated to be .15, .15, .50, and .20, respectively, then the following frequency polygon can be constructed:

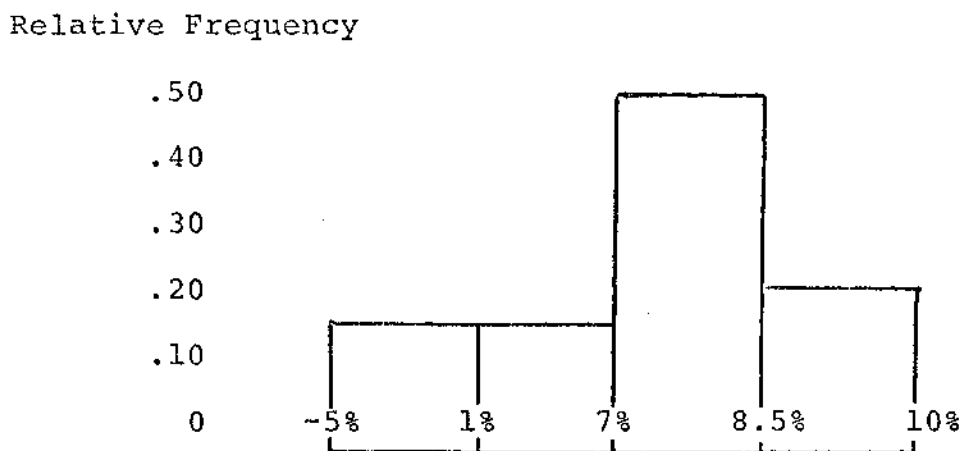


Fig. 32--Expected growth rate in rate of return on investment (gR_{Inf}).

The preceding frequency polygon is for expected growth in rate of return on investment for all nonfinancial corporations. In a manner identical to that which was used in developing the frequency polygon above, a similar one for expectations of growth rates in total investment can be developed. The final product is presented below.

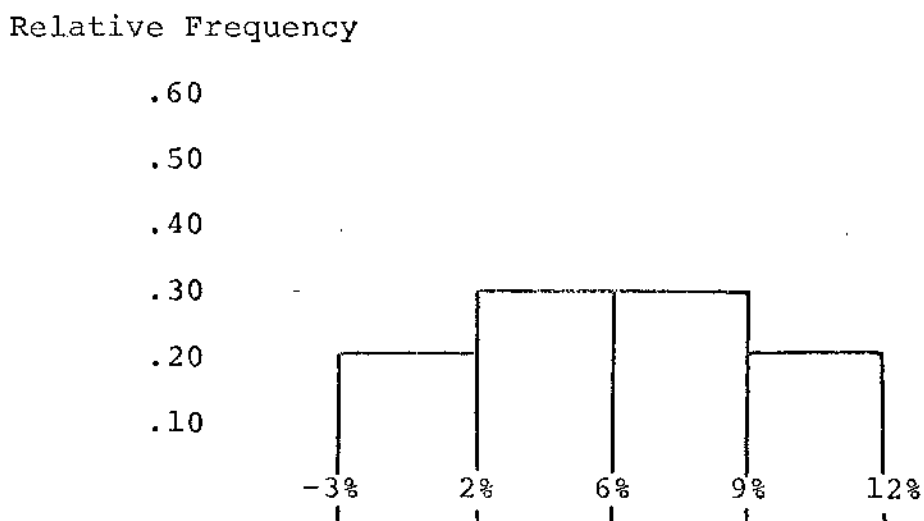


Fig. 33--Expected growth of investment (gI_{Inf})

The relative frequencies (i.e., subjective probabilities) of the intervals from left to right in the preceding diagram are .20, .30, .30, and .20. Once frequency polygons such as the preceding ones have been defined, then it is possible to perform a simulation of the first component of future income for the conglomerate. By allowing the class mean to be representative of all of the expectations within a single class, the simulation procedure can be simplified. If this is done, then the implicit assumption is made that in the long-run the expectations to the left and right of the individual class means have equal probabilities.

To perform the simulation adequately, a computer program is almost imperative; however, for purposes of illustration a mechanical simulation under simplified assumptions is made. To begin with, it was assumed that only four states of the world were considered as relevant possibilities. Each of these states would correspond to specific values for the expectations contained in the preceding frequency distributions. For purposes of illustration let it be assumed that the four states of the world being simulated are characterized by the following expectations:

- (1) $g_{R_{Inf}}$ of 7.75% and $g_{I_{Inf}}$ of 4%
- (2) $g_{R_{Inf}}$ of 4% and $g_{I_{Inf}}$ of 4%
- (3) $g_{R_{Inf}}$ of 4% and $g_{I_{Inf}}$ of 7.5%
- (4) $g_{R_{Inf}}$ of 7.75% and $g_{I_{Inf}}$ of 7.5%

By substituting the values into the equations on page 221 for g_{Inf} and gR_{Inf} which correspond to the four states of the world being simulated, the income to be derived from resources employed by the parent company at the time of valuation are determined. Since the example is hypothetical anyway, the numerical calculations are not carried out.

An Alternative Approach

Instead of relating expectations for the individual groups of resources to the expectations for all nonfinancial corporations a different, and perhaps more appropriate, method can be conceived. Namely, it would be possible for the analyst or other person performing the valuation to express his expectations for each of the specific sets of resources employed by the parent at the time of valuation. These expectations could be defined by projecting again the most likely, most optimistic, and least optimistic expectations. However, in this case, these projections would be for the individual sets of resources and not for all nonfinancial corporations. Once such a projection was made, frequency polygons could be created by bisecting the angles, as before. In a manner such as this, probabilistic expectations could be defined for growth in rate of return on investment and growth in total investment for all sets of resources employed at the time of valuation.

If individual frequency distributions are created for specific operating units within the company, then special allowance must be made for "covariance." To do this, conditional expectations would have to be defined. For example, if a particular conglomerate company operated only in two industries, then the following steps would be followed in defining probabilistic expectations:

(1) Select the industry whose expected growth of investment and growth rate of return on investment is the more stable, and use these expectations as the reference distributions.

(2) Form the reference distributions by defining the most likely trend, the least optimistic, and the most optimistic trends. (Bisect the angles to create the desired number of ranges.) Also, attach subjective probabilities to the ranges created.

(3) Allow the class mean to represent each class created in step two.

(4) For the second industry in which the firm is operating, define conditional expectations based on given values for growth rates corresponding to each of the class means in the reference distribution. That is, for each of the class means in the reference distribution, define the conditional expectations for the second industry.

With only two industries, there will be two distributions representing expectations for growth in rate of

return on investment and growth in total investment in the reference industry. If the reference distributions contain four classes each, then the conditional expectations for industry number two can contain as many as eight distributions--four reflecting conditional expectations for growth in rate of return on investment and four reflecting conditional expectations for growth in total investment.

By adopting this alternative procedure, any possible covariance of growth rates is incorporated into the conditional probability distributions. The only disadvantage of such an approach is that the number of distributions required increases geometrically as the number of industries increases arithmetically. Note, that if specific sets of resources operating within a particular industry have differing expectations, then separate expectations can be defined just as if they were operating in separate industries.

Simulation of Acquisition Income

In order to simulate future levels of acquisition income, or more accurately, income from future acquisitions, the following variables must be endowed with probabilistic expectations:

- (1) I_a --The average annual size of future acquisitions
- (2) R_{I_a} --The average rate of return on investments in the year of acquisition for future acquisitions
- (3) g_{I_a} --Average annual rate of internal expansion of future acquisitions after acquisition

- (4) gR_{Ia} --Average annual growth in rate of return on investment after acquisition for future acquisitions.

The approach recommended for simulating the preceding variables is identical in nature to that recommended as an alternative method for simulating future income from resources controlled by the company at the time of valuation. Specifically, it is recommended that subjective probability distributions be developed for each of the four variables, based upon most likely expectations, most optimistic expectations, and least optimistic expectations. Of course, as before, the bisection of the angles between the various expectations will lead to specific classes of expectations for which subjective probabilities can be defined.

If it is considered desirable, covariance between the four types of variables can be recognized by defining one of them as the lead variable and developing conditional expectations for the others. For purposes of illustration it will be assumed that covariance between the four variables is not considered relevant. Accordingly, the distributions presented in the following figures represent the end products of the process described previously.

If the possibility of covariance is considered to be significant, then these distributions can be used to simulate future income streams to be derived from future acquisitions. Again, to make an adequate simulation, the use of a computer would probably be necessary; however, for purposes of

Relative Frequency

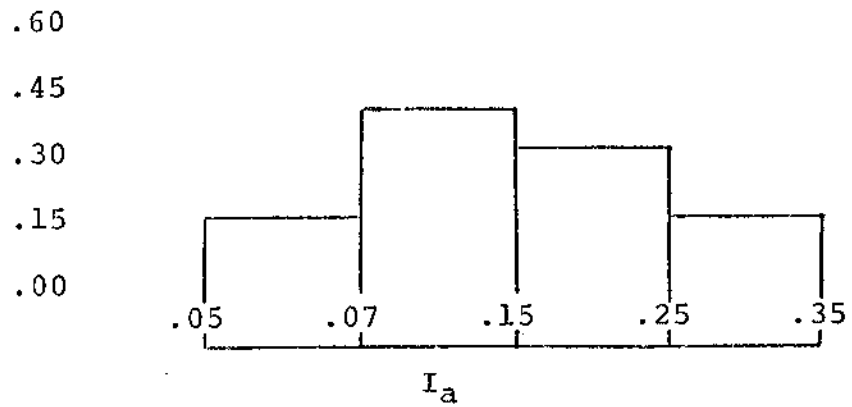


Fig. 34--Range of possible expectations for I_a in millions of dollars.

Relative Frequency

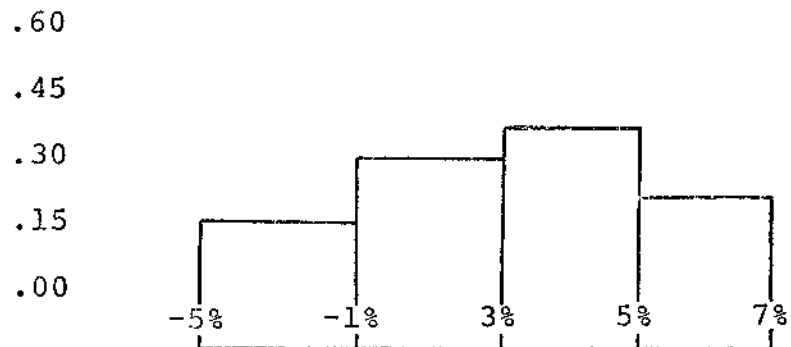


Fig. 35--Range of possible expectations for growth in total investment of future acquisitions after acquisition (gI_a).

Relative Frequency

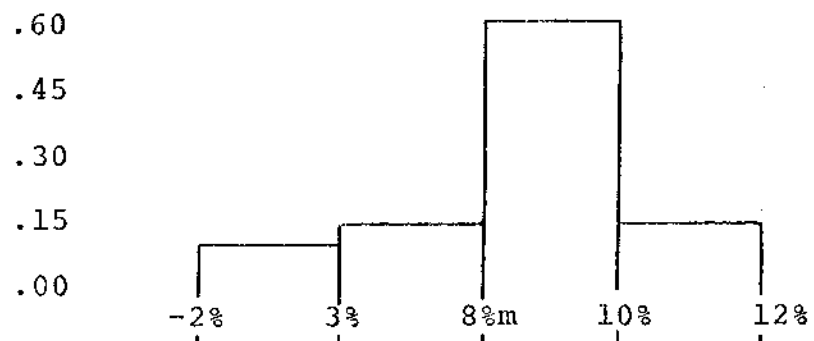


Fig. 36--Range of possible expectations for rate of growth in return on investment of acquisitions after acquisition (gRI_a).

Relative Frequency



Fig. 37--Range of possible expectations for rate of return on investment of acquisitions in the year of acquisition (R_{Ia}).

illustration, it is assumed that only four states of the world are considered possible. These states are

	I_a	gI_a	R_{Ia}	gR_{Ia}
(1)	$.065 \times 10^6$	4%	7.5%	9%
(2)	$.110 \times 10^6$	6%	5 %	11%
(3)	$.200 \times 10^6$	1%	3 %	5.5%
(4)	$.110 \times 10^6$	6%	3 %	9%

By substituting the numerical values above into the equation on page 212, the corresponding values for income from acquisitions can be determined. The values for income thus determined along with operating income previously determined form the total gross income available to the conglomerate.

As noted previously, the variables which determine the value of earnings per share for conglomerates are the following:

(1) Operating income from parent and subsidiaries acquired prior to the point in time at which valuation is to occur. This component of income is determined by I_p , R_{I_p} , g_{I_p} , and FR_{I_p} . Depending upon how many different markets a firm is operating in, the preceding variables are used several times to describe the operations of a single conglomerate.

(2) Acquisition income, or more specifically, income from resources acquired externally in the future. This component of total income in the future depends upon the values for I_a , R_{I_a} , g_{I_a} , and gR_{I_a} .

(3) Rates of return paid to debt, preferred stock, and holders of minority interest. These variables are denoted by R_d , R_p , and R_m , respectively.

(4) Leverage variables reflecting level of taxes, level of debt, level of preferred stock, and level of minority interest. These variables can be denoted by T , $\frac{D}{I_t}$, $\frac{P}{I_t}$, and $\frac{M}{I_t}$, respectively.

Since values for all of the preceding variables can be viewed as being generated under conditions of future uncertainty, related expectations must be stated in terms of probabilities. So far, the variables included in one and two above have been expressed in this manner, and a framework for simulating different possible conditions has been established. The next two sections of the paper are concerned with three and four.

Simulation of R_d , R_p , and R_m

It would be necessary for the person placing values on the shares of conglomerate companies to define covariance patterns and future expectations, or sets of expectations for R_d . The expectations for R_d could be short-run or long-run in nature, depending upon the preferences of the individual placing the values. In any case, it would be necessary to calculate the average annual rate of interest paid for each year of the ten-year simulation period and then calculate the overall weighted average. This overall weighted average would then be multiplied by total debt for each year of the simulation to derive total annual interest payments. This task (i.e., finding annual payments made to debt holders) is no problem once the appropriate numerical values for R_d and D have been derived; however, deriving the numerical values may be a slightly more complex problem.

The approach which is recommended for simulating future values for R_d is to relate the expectations for gR_{dnf} (which is hereby defined as the average annual percentage growth rate of interest paid by nonfinancial corporations during the ten-year valuation period) to the subjective expectations previously defined for gI_{nf} . This recognition of covariance is based upon the assumption that periods of rapid expansion (characterized by relatively high values for gI_{nf}) will also be periods in which debt financing and interest rates are at relative highs. If this assumption is proper, then

conditional subjective expectations which recognize covariance patterns between gI_{nf} and gR_{dnf} are not unrealistic. Accordingly, it would be necessary for conditional expectations to be defined for gR_{dnf} which would be predicated on what values are selected for gI_{nf} . Following the same procedure used before to establish conditional expectations--four probability distributions could be defined, each one corresponding to the mean of the classes in the distribution for gI_{nf} . Then, depending upon the value selected for gI_{nf} , the corresponding value for gR_{dnf} could be derived by sampling from the related distribution.

One additional expectation would be required in order to simulate values for R_d ; namely, it would be necessary to relate expectations for changes in the growth rate paid on debt by the particular company to expectations for all non-financial corporations. For example, it might be assumed that the particular company being valued always paid a slightly lower rate of interest than the average rate paid by all nonfinancial companies--in which case, a relationship such as the following could be defined:

$$gR_d = (.85)(gR_{dnf})$$

The relationship expressed in the preceding equation is that the rate of interest paid is always 85 percent of the rate paid by all nonfinancial corporations. Thus, to summarize, R_d would be dependent upon the following:

- (1) the value selected for gI_{nf} ,
- (2) the value selected from the related probability distribution for gR_{dnf} , and
- (3) the assumed relationship between gR_{dnf} and gR_d .

In the simulation of R_p and R_m several alternatives are possible. It may be feasible to assume that the rate paid to preferred, per share, remains the same over time. Or, if it is considered desirable, subjective expectations can be defined and used in simulating future levels for R_p . Also, conditional expectations can be defined to reflect any covariance which is believed to exist between R_p and other variables influencing earnings per share. The same conditions apply equally to R_m . For purposes of illustration it is assumed that covariance is not significant and that subjective expectations for both R_m and R_p are determined by defining the most likely, most optimistic, and least optimistic expectations. The following distributions are examples of how the end result of the process might appear.

Relative Frequency

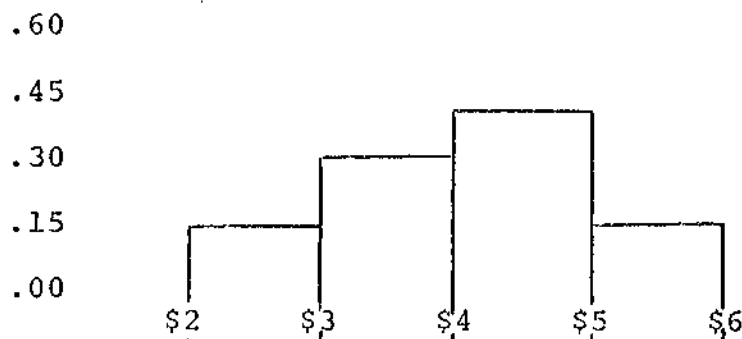


Fig. 38--Yields on preferred stock (expected)

Relative Frequency

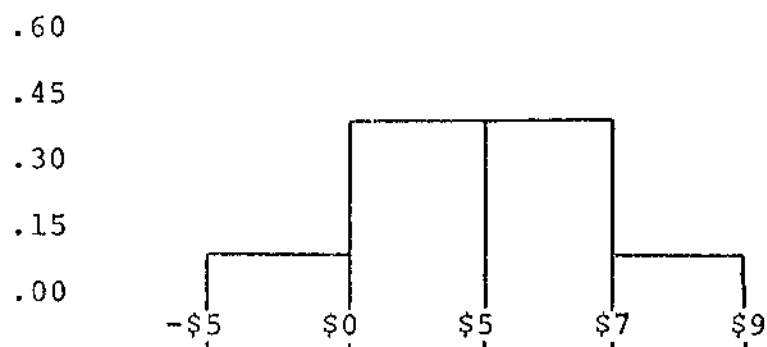


Fig. 39--Rate paid per share to minority interest (expected).

For purposes of illustration, it is assumed that the four states of the world being simulated are characterized by the following values for R_p and R_m :

	R_p	R_m
(1)	\$2.50	\$6.00
(2)	\$3.50	\$2.50
(3)	\$5.50	\$8.00
(4)	\$3.50	\$6.00

Since the change in the level of interest rates was related to g_{Inf} , it follows that states of the world 1, 2, 3, and 4 will be dependent upon the related value for g_{Inf} .

Hence,

	g_{Inf}	Conditional expectations for $g_{R_{dnf}}$	Related value-- g_{R_d}
(1)	4%	3.6%	3.06%
(2)	4%	3.6%	3.06%
(3)	7.5%	6.75%	5.74%
(4)	7.5%	6.75%	5.74%

Simulation of Leverage Variables

The remaining variables which must be simulated in order for conditional values for earnings per share to be derived are T , $\frac{D}{I_t}$, $\frac{P}{I_t}$, and $\frac{M}{I_t}$. Subjective distributions for these variables including conditional expectations could be defined, just as before. However, for purposes of illustration, it is assumed that these variables maintain constant and known values during the period of simulation. That is, regardless of the state of the world, the following are the values which are assumed to exist:

T --50%

$\frac{D}{I_t}$ --30%

$\frac{P}{I_t}$ --3.2 shares per \$1000 of investment

$\frac{M}{I_t}$ -- .6 shares per \$1000 of investment

$\frac{S}{I_t}$ --1.5 shares per \$1000 of investment

With the addition of the preceding values for the leverage variables, it is possible to fill in numerical values for all of the desired components of the matrix on page 215. Once conditional values have been determined for average earnings per share for each of the states of the world assumed to exist, then the average Y_t for each state of the world can be weighted by its respective probability to determine the expected present value. Since the example under consideration is hypothetical and many iterations

would be necessary for the example to be meaningful, the numerical calculations are not carried out.

In conclusion, it is probably worth noting that an adequate simulation model along the lines just described would require a computer. This is true because of the inability to handle, mechanically, all of the variables and the different possibilities which they represent. Instead of including a computer simulation as part of this project, consideration has been limited to a description of the rudiments of the model which would be necessary to perform an adequate simulation. A program for valuing shares in conglomerate companies along the lines just described has been written and is currently in the final stages of refinement; however, the program and its application to specific companies is deferred and not considered to be a necessary part of this project.

BIBLIOGRAPHY

Books

- Bierman, Harold and others, Quantitative Analysis for Business Decisions, Homewood, Illinois, Richard D. Irwin, Inc., 1965.
- Clendenin, John C. and George Christy, Introduction to Investments, 5th edition, New York, McGraw-Hill Inc., 1969.
- Graham, Benjamin and others, Security Analysis, New York, McGraw-Hill Book Co., 1962.
- Howell, James E. and Daniel Teichroew, Mathematical Analysis for Business Decisions, Homewood, Illinois, Richard D. Irwin, Inc., 1963.
- Keynes, John M., The General Theory, New York, McGraw-Hill Book Co., 1964.
- Madden, Edward H., The Structure of Scientific Thought, Boston, Houghton Mifflin Co., 1960.
- Prather, Charles L., Financing Business Firms, Homewood, Illinois, Richard D. Irwin, Inc., 1961.
- Schlaifer, Robert, Introduction to Statistics for Business Decisions, New York, McGraw-Hill Book Co., 1961.
- Van Horne, James C., Financial Management and Policy, Englewood Cliffs, New Jersey, Prentice-Hall Co., 1968.
- Walker, Ernest W., Essentials of Financial Management, Englewood Cliffs, New Jersey, Prentice-Hall, Inc., 1965.
- Williams, John Burr, Theory of Investment Value, Cambridge, Massachusetts, Harvard University Press, 1938.

Articles

- Ackerman, Robert W. and Lionel L. Fray, "When the Return-on-Investment Criteria Are Applied to the Discounted Future Earnings of a Proposed Acquisition a Somewhat Truer Picture of Financial Value Emerges," Financial Executive, XXXV (October, 1967), 35-54.

- Bjorksten, Johan, "Merger Lemons," Mergers and Acquisitions, I (Fall, 1965), 36-38.
- "A Closer Look at Conglomerates," Financial World, CXXIX (February 14, 1968).
- Briloff, Abraham J., "Distortions Arising from Pooling-of-Interests Accounting," Financial Analysts Journal, XXIV (March-April, 1968), 71-80.
- "Business Combinations," Accounting Research and Terminology Bulletins (Bulletin #48), New York, American Institute of Certified Public Accountants, 1961, p. 22.
- Christy, George A., "Does Today's Investor Appreciate the Diversified Firm's Significance," The Commercial and Financial Chronicle, CCIII (April 7, 1966), 1-20.
- "Conglomerates," Forbes, CI (January 1, 1968), 53-55.
- "Glamour Stocks that Ran into Trouble," U.S. News and World Report, LXIV (March 18, 1968), 112-113.
- "How Much Data Must Conglomerates Bare?" Business Week, No. 2001 (January 20, 1968), pp. 53-55.
- "Justice Agency Issues Merger Guide," The Wall Street Journal, Southwest edition, CLXXI (May 31, 1968), 1, 4.
- Kitching, John, "Why Do Mergers Miscarry?" Harvard Business Review, XLV (November, December, 1967), 84-101.
- Mautz, Robert K., "Findings and Recommendations Released on Financial Executives Research Foundation Study," Financial Executive, XXXVI (February, 1968), 18-28.
- _____, "Identification of the Conglomerate Company," Financial Executive, XXXV (July, 1967), 53-64.
- "Measuring the Surge of Mergers," Business Week, No. 2013 (March 23, 1968), p. 69.
- "Mergers on Parade," Mergers and Acquisitions, III (March-April, 1968), 78-79.
- Patterson, James M. and D. Jeanne, "Conglomerates: The Legal Issues--A Review of Public Policy Needed," Business Horizons, XI (February, 1968), 39-48.

"Random Walks in Stock Market Prices," Financial Analysts Journal, XXI (September, October, 1965), 55-59.

Stabler, Charles N., "The Conglomerates Impact of Big Combines on the Economy Defies Oil-fashioned Analysis," The Wall Street Journal, Southwest edition, CLXVII (August 12, 1968), 1.

Tanner, James C., "Ling's Empire," The Wall Street Journal, Southwest edition, CLXX (August 18, 1967), 1.

Wall, John, "Want to Get Rich Quick?" Barron's, XLVIII (February 5, 1968), 5-19.

Wendt, Paul F., "Current Growth Stock Valuation Methods," Financial Analysts Journal, XXI (March-April, 1965), 91-102.

Reports

Moody's Industrial Manuals, Moody's Investor Service, New York, 1957-1967.

Moody's Handbook of Common Stocks, Moody's Investor Service, New York, 1st, 2nd, and 3rd Quarterly Editions.

"Some Problems of Disclosure," excerpted from an address by Manuel Cohen, Chairman, Securities and Exchange Commission, March 7, 1968.

Standard and Poor's, Security Owner's Stock Guide, Standard and Poor's Corporation, New York, January, 1968-January, 1969.

10-K Reports to the Securities and Exchange Commission, Washington, D.C., 1964-1967: Teledyne Company, Textron Inc., and Automatic Sprinkler.