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CHAPTER 4

Some Problems of Growth and Appreciation

In the construction of weights for book value, dividends, and earnings, no adequate adjustment was made for growth and capital appreciation. The inclusion of earnings allowed for an element of growth, because the ratio E/D provides some indication of the rate at which book value grows from retained earnings. But the mere weight for earnings in our system does not specifically measure growth.

The failure to take adequate account of growth and capital appreciation was no oversight. Chapter 2 has already mentioned briefly an attempt to incorporate into the weighting system other factors in addition to book value, dividends, and earnings. Among these others were such obvious growth indicators as average rate of increase for earnings and for dividends. Since no consistent or statistically significant relation could be found between these other factors and bank stock prices, another attempt was made to analyze growth statistically, this time through the medium of price movements. A brief account of the analysis may be of interest.

From the data collected for the statistical determination of weights, price changes for stocks in groups I and II were analyzed over three intervals — early 1946 to early 1949, early 1946 to early 1953, and early 1949 to early 1953. For each of the intervals, percentage changes in price for the two groups were related to percentage changes in book value, in dividends, and in earnings by the same multiple regression technique used to establish the weights in Table 2. The result was a new and different set of weights, having the property of measuring the market's appraisal of changes in the three factors over a period of time. If, in this new set, the weights

for increased book value had been high, they would have reflected indirectly the importance of retained earnings, which are the primary source of increases in book value and an important means of growth. However, after the weights were calculated, they were tested statistically and found to be totally unreliable. Thus we still lack empirical evidence concerning not only the relation between retentions and price appreciation, but also many other aspects of growth and appreciation.

This inability to turn out a satisfactory statistical analysis of growth may, of course, indicate that bank stock investors as a class are not particularly interested in growth — or even that such bank stock investors as are interested in growth look for it in other types of stocks while buying bank stocks for steady income. But we cannot brush this important subject off quite so lightly. The next two sections will examine some theoretical aspects of growth in relation both to the weighting system and to derived estimates of required rates of return — first from the standpoint of bank stock investors seeking to evaluate the importance of dividends versus earnings, and second from the standpoint of bank managements seeking to formulate dividend policy in the light of growing needs for equity funds.

The Investor's Point of View

The analytical bank stock investor faces the problem of selecting a portfolio that will provide maximum return with due allowance for growth, safety, and diversification. In short, he is a bargain hunter, looking for the most attractive stocks at current prices. In Chapter 2, especially Table 2 and Chart 2, he finds empirical formulae for obtaining the weighted average appraisals of a list of stocks, from which he can select those that appear relatively underpriced. But also in Chapter 2 he learns some of the limitations inherent in this approach, including the susceptibility of the weights to statistical sampling errors and the fact that some relevant factors — above all, growth and appreciation — have necessarily been omitted from the weighting system.

Now we come to another limitation — namely, that the weighting system has been designed without much regard for theoretical principles of valuation. According to economic theory, the value of a stock is obtained by discounting the expected dividend payments by the formula

$$V = \frac{D_1}{1+i} + \frac{D_2}{(1+i)^2} + \frac{D_3}{(1+i)^3} + \text{etc.}$$

This formula is the essence of simplicity for applications in which the dividend stream is expected to remain constant — as with high grade preferred stocks offering no hope of a dividend increase and little risk of a decrease. In fact, the formula reduces simply to D/i for constant dividends, as is well known; and this form is consistent with an empirical weighting system in which i is the average yield (the geometric average in our system) and the weight for dividends is arbitrarily one.

When dividends are not expected to remain constant, complications arise, and the simple formula D/i requires modification. Of primary interest here are modifications for adapting the formula to stocks with potential growth in book value, dividends, earnings, and market price. To modify the formula realistically — allowing for all the uncertainties inherent in forecasting the various elements of growth — would be difficult at best. Nevertheless, an elementary growth formula can be developed from a sufficient set of simplifying assumptions. Whether the resulting formula is so oversimplified as to be worthless for practical stock appraisal is a real question; but since it has value for illustration and raises a number of pertinent questions, it warrants discussion.

The modification of D/i to permit simple appraisal of growth rests on the assumption that the following ratios remain constant indefinitely: first, the rate of return on capital, E/B ; second, the payout ratio, D/E ; third, the rate of growth in book value, $(E - D)/B = g$. Then, earnings and dividends must grow at the same rate, g , as book value, and the discount formula becomes

$$V = \frac{D_1}{1+i} + \frac{D_1(1+g)}{(1+i)^2} + \frac{D_1(1+g)^2}{(1+i)^3} + \text{etc.}$$

This is simplified to¹

$$V = D_1 \frac{1 - (1+g)^n / (1+i)^n}{i-g}$$

if the number of payments is finite, and it is simplified still further to²

$$V = D_1 / (i - g)$$

¹See, for example, *The Institute of Actuaries' Text-Book on Compound Interest and Annuities-Certain*, by Ralph Todhunter, 4th edition, revised by R. C. Simmonds and T. P. Thompson, Cambridge University Press, 1937, pp. 48-49.

²This formula was first brought to my attention by Volkert S. Whitbeck and Avram Kisselgoff, later by Myron S. Gordon and Eli Shapiro — all of whom were interested in evaluating growth stocks. A derivation of essentially the same formula is to be found in *The Theory of Investment Value*, by J. B. Williams, Harvard University Press, 1938, pp. 87-89 and 129-34. Since

if the number of payments is infinite and if i exceeds g . When the growth rate g is zero, this formula reduces to D_1/i , which is the present value of a level stream of dividends; and as g increases, the present value increases — approaching infinity as g approaches i . This fact throws considerable doubt on the suitability of the formula for appraising stocks with high growth rates.³

Although the above formula is neat and compact, a more illustrative variant is obtained by expressing g in terms of its elements and rearranging as follows:

$$\frac{D_1}{i-g} = \frac{B D_1}{B(i-E/B) + D_1} = \frac{B}{B(i-E/B)/D_1 + 1}$$

This arrangement shows immediately that the discounted value of a growth stock depends not only on the dividend, but on earnings and book value as well. Thus the discount formula includes the same three factors that were included in the empirical weighting system, though the manner of inclusion is different.⁴

The rearranged form of the discount formula implies an important relation between V and B . When $i = E/B$, the parenthesis in the denominator is zero and $V = B$; that is, when the rate earned on capital is equal to the rate of discount, bank stocks should sell at book value. Moreover, when i is greater than E/B , V is less than B ; conversely, when E/B is greater than i , V is greater than B . In effect, the formula implies that i is the rate of earnings required to support bank stocks at book value.

The last arrangement of the growth formula has, in addition, important implications for dividend policy. When $i = E/B$, the parenthesis is zero and D disappears entirely from the formula — with the implication that the dividend rate has no effect on value. This result is rendered even more conclusive, perhaps, by the direct relationship between retained earnings and increments in V . Under the assumptions of the formula and the condition $i = E/B$, V must always equal B , so that any increment in B resulting from retained earnings must be accompanied by an exactly equal increment in V . Therefore, the total return on investment is $i = E/V = E/B$, of which

Williams considers this formula unrealistic on the grounds that growth cannot continue forever, he develops an alternative formula on the assumption that growth will follow a curve that flattens out after a more or less predictable future date (see especially pp. 89-94 and 128-50).

³See, for example, John C. Clendenin and Maurice Van Cleave, "Growth and Common Stock Values," *Journal of Finance*, Vol. 9 (1954), pp. 365-76.

⁴See Appendix A, equation (1).

the portion D/V represents current dividend income and the remainder, $(E - D)/V$, is capital appreciation. To make a long story short, retained earnings appear just as valuable to the investor as dividends when $i = E/B$.

When E/B is greater than i , and V therefore greater than B , increments in V will also be greater than increments in B resulting from retained earnings. Then retained earnings are worth more to the investor than dividends, and the formula

$$V = \frac{B}{B(i - E/B)/D + 1}$$

bears this out; V actually increases as D decreases, since the parenthesis is negative when E/B exceeds i . The converse is true when i exceeds E/B . Then V increases as D increases, and the value of retained earnings is less than the value of dividends.

For reappraising the empirical weighting system, the salient conclusions in the foregoing theoretical development appear as follows:

1. There is a level of earnings, $E/B = i$, that equates discounted value and book value, and at this level dividend payout has no effect on discounted value.
2. At higher levels of earnings, discounted value exceeds book value, and restriction of dividends actually tends to increase discounted value.
3. At levels of E/B less than i , discounted value is less than book, and increases in dividends tend to increase discounted value.

These conclusions are at odds with the empirical researches described in previous chapters. For one thing the weighting system was designed on the assumption that a constant weight for dividends, or any other factor, would apply uniformly to a group of stocks showing considerable variations in the ratio P/B ; and indeed, it was by analyzing such variations that we were able to estimate the rate of return required to support bank stocks at book value. For another, the table of weights provides plenty of examples of a high weight for dividends occurring in a stock group at times when the average price was approximately equal to book value — that is, at times when the weight should have been zero according to the discount formula. But even if we regard the discount formula with suspicion because of the unrealistic assumptions underlying it, and even if we reject the conclusion of a zero weight for dividends when price equals book value, we cannot ignore the possibility that the weight for divi-

dends varies in some way or other with the ratio P/B — though not necessarily in the manner implied by the discount formula.

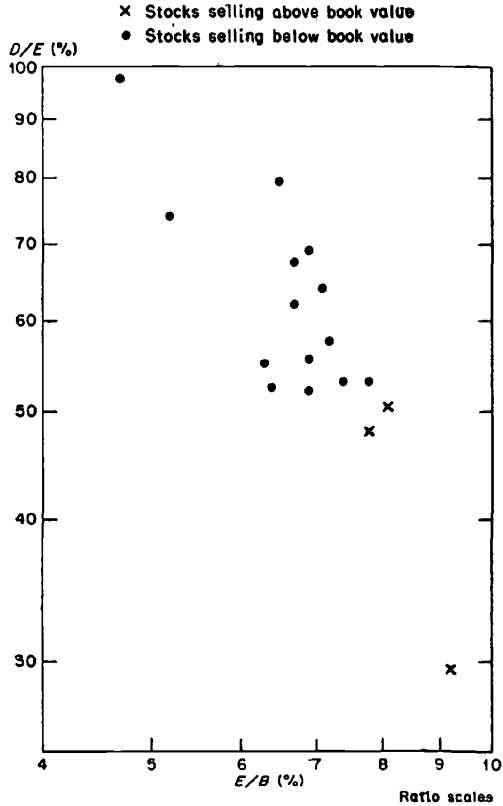
Another conclusion arising from the discount formula is that the ability to earn a rate of return E/B greater than i , so that price will exceed book value, is an important, if not essential, characteristic of a growth stock; for then the investor finds that retained earnings are worth more to him because of their growth potential than earnings paid out in dividends. But bank stocks are not growth stocks; at least they are not currently so regarded by any great fraction of the investing public. Ever since the early 1930's they have been unable to maintain a consistent position at or above book value — although individual issues may have behaved exceptionally and group averages may have shown prices slightly above book value from time to time. In addition, the very fact that high weights for dividends occur so frequently in Table 2 indicates a general market preference for dividends and a skepticism about the long-run growth potential of retentions.

Of course, individual investors' appraisals of growth may vary greatly. Some investors, for example, need regular income, among them certain tax-exempt institutions as well as retired people living on income from investments. Others, however, will prefer their income deferred, especially when there is an opportunity for capital gains; among these will be found persons who are in high tax brackets or who are saving for their old age. Such diverse classes of investors can hardly be expected to discount the same stream of dividends in the same fashion. For the most part, the class needing steady income may be expected to discount remote dividends at a higher rate than the class desiring accumulation and capital gains. In addition, the former class may be willing to pay a premium for stocks that pay regular, generous dividends — even when such stocks offer little prospect for capital appreciation. And indeed, the observed predominance of high weights for dividends in Table 2 — even for groups and years when price exceeds book value and retentions should be more valuable than dividends according to the discount formula — may well suggest that this type of investor dominates the bank stock market. The question must remain open, however, since conclusive evidence on stockholder characteristics is not available, though some fragmentary data are reported in Appendix B.

A sidelight on investor reaction to dividend policy and growth appears in Chart 12, which shows the seventeen New York City bank stocks with D/E plotted on the vertical axis against D/B on the horizontal, and with the issues selling above book value distinc-

CHART 12

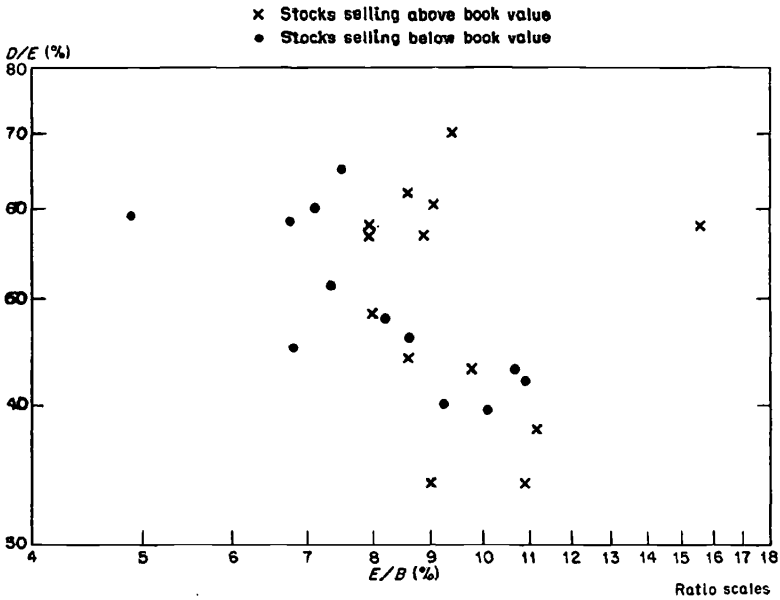
Relation between Earnings Rate and Payout Ratio for Stocks of
17 New York City Banks, Early 1953



tively rendered. Here the tendency is clear for the most profitable institutions to retain the most earnings; moreover, the stocks of the three banks lying farthest to the lower right, in the direction of high earnings and heavy retentions, are the only stocks selling above book value. Under the circumstances, it is not surprising that the empirical weight for dividends has been low in the New York group. Among the twenty-five large banks outside New York (Chart 13), on the other hand, there is no clear evidence of a tendency for the most profitable banks to retain the most earnings — though the suggestion of such a tendency is barely discernible by the device of eliminating the stock on the extreme right and that on the extreme left. There is also no more than a barely discernible tendency for the stocks selling above book value to lie farther toward the lower right than the stocks

CHART 13

Relation between Earnings Rate and Payout Ratio for Stocks of
25 Large Banks outside New York, Early 1953



selling below book value.

*Growth, Sources of Equity, and Required Rates of Return from the
Standpoint of Bank Management*

The foregoing conclusions on growth stock valuation seem to reduce the capital problem as it faces bank management to a very simple formulation: namely, that although banking is a growth industry with continuous demands for additional capital, bank stocks do not enjoy the privileged position of growth stocks; if they did, the bank capital problem would be largely mitigated. Actually, of course, bank management tends to formulate the capital problem in terms of the ratio of price to book value. But although the disadvantages of issuing stock below book value, as well as the advantages of issuing it above, are widely discussed and seem to be fairly well understood,⁵ one important technical detail needs emphasis. The alleged dilution or deterioration associated with issues below book

⁵See, for example, *The Problems of Adequate Bank Capital*, by Gaylord A. Freeman, Jr. (Illinois Bankers Association, May 1952). Or again, for a discussion of the advantages of issuing stock above book value in an industry where

value is not due to a low issue price *per se* but rather to unsatisfactory earnings. Given earnings and dividends sufficient to justify a market price in excess of book value, stockholders can actually profit from issues below book value. An example should make this clear.

Suppose that the holders of a bank stock with the characteristics

Book Value	\$100
Dividends	5
Earnings	10
Price	120

are offered the opportunity to subscribe for one additional share at \$60 for each four shares held. The subscription will have the effect of reducing book value per share from \$100 to \$92 as follows:

4 shares at	\$100	\$400
1 share at	60	60
5 shares at	92	<u>\$460</u>

and of reducing earnings per share proportionately from \$10 to \$9.20 — provided *E/B* remains constant. Dividends could, of course, remain unchanged at \$5.00, but the arithmetic will be simplified if they are reduced proportionally to \$4.60. Then, a proportional reduction in the market price may be expected — from \$120 to \$110.40 — and on this basis a comparison of the stockholder's position before and after the subscription appears as follows:

4 shares at market	\$480		
Cash for 1 share	<u>60</u>	5 shares at \$110.40	\$552
	\$540		

The subscriber, therefore, enjoys an unrealized gain of \$12, which accrues because the bank is assumed to earn and pay a sufficient rate on equity to support its stock at a premium above book value. Additional equity is assumed to earn and pay the same return, and to command the same premium. The \$12 gain is simply a 20 per cent premium on a \$60 investment. The situation would have been entirely different if the bank had earned \$6 and paid \$3 on the same \$100 of equity — commanding a price of, say \$80. Then, a calculation similar to the above indicates that a stockholder would lose \$12 on each additional share — the result of a 20 per cent discount on a \$60 investment.

Possibly this example has more implications than are intended.

this is often possible, see "Book Value and Market Prices of Electric Utility Stocks," by Charles Tatham, Jr., *Analysts Journal*, Vol. 9 (1953), November, pp. 33-36.

Because of its simplified arithmetic, it may suggest that the issue price of the stock is totally irrelevant, which is not quite true. In the first place, there may be psychological or market advantages if one issue price is chosen rather than another. Or again, there may be psychological advantages to maintaining the dividend at \$5.00; but this might be difficult if a very large number of new shares were issued at such a low price that earnings per share were substantially reduced. Finally, the example applies only to privileged subscriptions. If the stock were sold to outsiders at \$60 per share, the existing stockholders would suffer genuine dilution of their investment value.

Fundamentally, then, the crucial question is not the price at which the new stock is issued, but the rate of return on the proceeds of the issue. The bank stock investor derives potential appreciation from a stock issue on condition that the bank is able to earn a return sufficient to support its stock at a market price above book value. And with a privileged subscription, he derives this benefit even when the stock is issued below book value. But the earlier section of this chapter have indicated, on certain theoretical grounds, that the investor also derives potential appreciation from retention of earnings on the same condition of a rate of return sufficient to maintain a premium above book value. Superficially, it would appear that equity accumulation by either retentions or stock issues is encouraged by exactly the same circumstances — a high rate of earnings, a strong market, and prices in excess of book value. Conversely, accumulation by either method is discouraged under the opposite circumstances — with the proviso that the income tax may make accumulation of equity by retention appear attractive to some investors in high tax brackets even when stocks sell below book value.

The argument is pointing toward an anomalous conclusion: namely, that banks should avoid equity accumulation altogether whenever their stocks sell below book value. But this conclusion hardly permits of practical application. Given the necessity of acquiring equity under unfavorable circumstances, which was the lot of many banks during the war and postwar years, the management must decide which are less objectionable, retentions or stock issues. Although grounds for favoring retentions in an unfavorable market undoubtedly exist, they appear to be: first, the difficulty of pushing additional stock onto an unfavorable market; second, the tax status of stockholders, which may mitigate the loss of dividend income. The traditional argument that dilution results from stock sales below book value loses much of its force when it is recalled that retentions are subject to very much the same sort of dilution.