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## CHAPTER 3

### *Earnings, Dividends, and Discounts from Book Value*

This chapter will demonstrate how the weights for book value, dividends, and earnings, as presented in Table 2, can be used to estimate what rate must be earned and what rate paid on bank capital if bank stocks are to sell at book value. Admittedly, such estimates are subject to error. It has already been mentioned that the weights themselves are far less accurate than the two decimals to which they are carried. Similarly, estimates of the required rates of earnings and dividends, based on these weights, are not accurate to one-tenth of a percentage point — even though the estimating methods used imply this level of numerical accuracy. Nevertheless, the estimates are thought to be sufficiently reliable to bring out major trends over the years, as well as to indicate at least the order of magnitude of the discrepancy by which earnings and dividends fail to achieve the required level when stocks are selling below book value.

#### *Required Rates of Earnings, with Adjustment for Dividends*

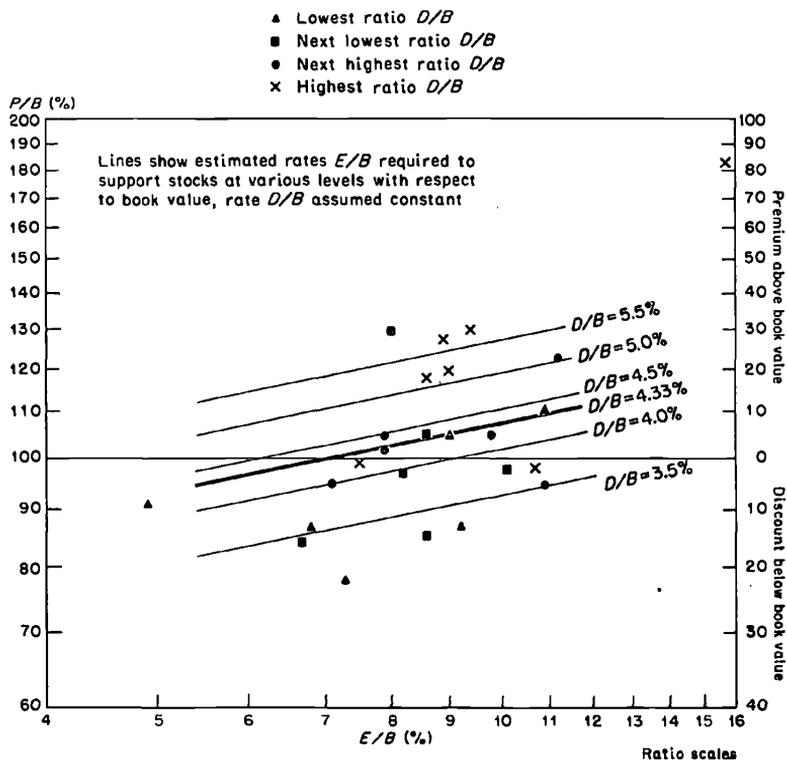
The problem of estimating the rate of earnings required to support bank stocks at book value has already been mentioned in Chapter 1 and illustrated in Chart 1 for the unusually simple situation where dividends exert little or no apparent effect on price. The chart, as previously explained, contains a trend line crossing the 100-per-cent-of-book-value line at  $E/B = 7.6$  per cent, thus providing the desired estimate of the rate of earnings required to support New York City bank stocks at book value in the early months of 1952. In constructing this trend line from the table of weights, it is convenient first to locate the point  $X$  representing the average ratio  $P/B = 89$  per cent and the average rate of return  $E/B = 6.3$  per cent. The location of any second point will then determine the line,

and such a point can be determined with the aid of the calculator provided in Chart 2. Suppose the rate of return  $E/B$  should increase by, say, 100 per cent — that is, from 6.3 to 12.6 per cent. (The choice of 100 per cent is merely to facilitate the arithmetic.) Given the weight of 0.64 for earnings, which applies to New York City banks in 1952, the expected price rise corresponding to a rise of 100 per cent in earnings can be read off the calculator at the point where the 100 per cent line crosses the vertical at 0.64. The answer is a 56 per cent rise in price, which implies a rise in the ratio  $P/B$  from 89 to 139 per cent. Thus the second point on the line is the location of  $P/B = 139$  and  $E/B = 12.6$  per cent.

When dividends exert an appreciable effect on price, which is the normal state of affairs according to Table 2, estimates of the required

CHART 3

Relation between Ratios of Earnings to Book Value and of Price to Book Value for Stocks Classified by Ratio of Dividends to Book Value, 25 Large Banks outside New York, Early 1953



rate of earnings must make some allowance for this. Chart 3 which deals with twenty-five large banks outside New York in early 1953 (see data in Table 5) is basically similar to Chart 1, but it incorporates two modifications designed to show the effects of dividends. First, the banks have been divided into four groups according to the ratio of dividends to book value,  $D/B$ , and these are identified by distinctive points. This arrangement seems to show a perceptible, though certainly not pronounced, tendency for the stocks with the lowest ratios of  $D/B$  to lie below, that is to sell for less than, the stocks with the highest ratios.<sup>1</sup> The second modification is the inclusion of six trend lines, instead of one, each representing a different value for the ratio  $D/B$ . One of these, which is drawn heavier than the rest, represents the average  $D/B = 4.33$  per cent, and is somewhat analogous to the single line of Chart 1. But the analogy is not complete, for the heavy line represents the relation between  $P/B$  and  $E/B$  for banks whose ratio  $D/B$  can be assumed to remain unchanged at 4.33 per cent even while  $E/B$  varies substantially. Thus the point where the heavy line crosses the 100-per-cent-of-book-value level, which indicates a required return of  $E/B = 7.1$  per cent, applies only so long as  $D/B$  is 4.33 per cent. The required rates of return for ratios of  $D/B$  equal to 3.5, 4.0, 4.5, 5.0, and 5.5 per cent are indicated by the five finely drawn trend lines.

As an alternative to Chart 3, with its unrealistic assumption of fixed dividends, Chart 4 rests on the assumption of a fixed payout ratio,  $D/E$ . In the latter chart, the scatter points are exactly the same as in the preceding, but they have been grouped according to the ratio  $D/E$  rather than  $D/B$ , and this grouping brings out a pronounced tendency for the stocks with the highest payout ratios to sell at higher prices than those with the lowest payout. Moreover, the trend lines in Chart 4 are quite obviously different from those of Chart 3, and call for a word about their construction. The heavy line, representing the average payout  $D/E = 50$  per cent, passes through the average  $P/B = 105$  per cent, and the average  $E/B = 8.75$  per cent; and in this respect it is exactly like the heavy trend line of Chart 3. But the process of locating a second point on this line requires a modification of the treatment applied in the preceding charts, where the effect of an increase in the rate of earnings was

<sup>1</sup>There is some question whether this tendency can be considered statistically significant. In fact, if a double dichotomy is formed with the points above and below the heavy line in one category against the points in the two upper and two lower  $D/B$  groups in the other category, the chi-square test will fail to show significance at the 5 per cent level.

determined only from the weight for dividends. Under the assumption of fixed  $D/E$ , a 100 per cent increase in earnings would naturally be accompanied by a like increase in dividends, and the proper weight to apply is therefore the sum of the earnings weight and the

TABLE 5

Price, Book Value, Dividend Rate, and Earnings of the Stocks  
of 25 Large Banks outside New York, Early 1953

BANK	PRICE	BOOK VALUE <sup>a</sup>	DIVIDEND RATE	EARN- INGS <sup>a</sup>
Fidelity Union, Newark	51¾	\$60.72	\$2.40	\$5.23
First National, Boston	53	52.02	2.40	4.13
National Shawmut, Boston	33	42.38	1.60	3.11
Fidelity-Philadelphia Trust	66	78.55	3.10	5.30
Pennsylvania Co., Philadelphia	41½	34.75	1.90	3.14
Philadelphia National	111	94.30	5.00	8.09
Central National, Cleveland	33½	35.33	1.60	3.84
National City, Cleveland	44½	45.86	1.80	3.76
Cleveland Trust	410	391.25	12.00	35.29
First National, Baltimore	49½	38.10	2.50	3.59
City National, Chicago	56½	65.20	2.00	4.44
Continental Illinois, Chicago	92¾	88.48	4.00	7.03
First National, Chicago	268	206.70	8.00	16.49
Harris Trust, Chicago	345	280.38	12.00	31.51
Northern Trust, Chicago	380	417.67	12.00	20.33
Detroit Bank	39	39.93	1.60	4.05
Manufacturers National, Detroit	63½	64.78	3.00	6.91
National Bank of Detroit	50	47.70	2.00	4.66
Republic National, Dallas	57½	44.94	2.28	3.98
First National, St. Louis	52½	53.00	2.60	3.98
California Bank, Los Angeles	59	67.91	2.50	6.27
Security First, Los Angeles	106½	96.58	3.60	10.53
American Trust, San Francisco	31½	33.05	1.40	2.35
U.S. National, Portland	66½	63.19	2.40	5.41
Bank of America, San Francisco	32	17.46	1.60	2.74
Geometric average	71.78	68.61	2.97	6.00

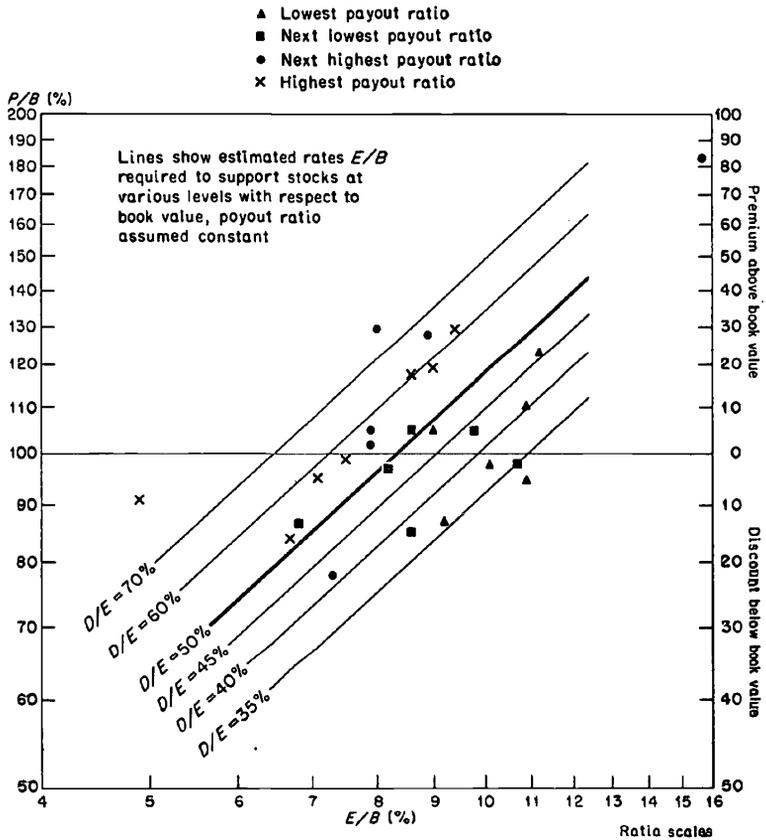
Based on Moody's, Standard's *Corporation Records*, the *Wall Street Journal*, the *Bank and Quotation Record*, and other published sources. Earnings (net operating earnings) refer to the preceding year, book value to the end of that year, and price and dividend rate to the end of January.

<sup>a</sup>Adjusted for splits, stock dividends, and other changes in the capital stock account occurring during January 1953.

dividend weight, which is 0.91 for the twenty-five large banks outside New York City.

### CHART 4

Relation between Ratios of Earnings to Book Value and of Price to Book Value for Stocks Classified by Payout Ratio, 25 Large Banks outside New York, Early 1953



The point where the heavy line of Chart 4 crosses the 100-per-cent-of-book-value level indicates the required rate of return on the assumption that the average dividend payout remains at 50 per cent, and this differs markedly from the required rate implied by Chart 3. In fact,

required rate,  $D/E$  constant at 50 per cent = 8.3 per cent  
 required rate,  $D/B$  constant at 4.33 per cent = 7.1 per cent

These compare with:

average $E/B$	= 8.75 per cent
average $E/P$	= 8.36 per cent

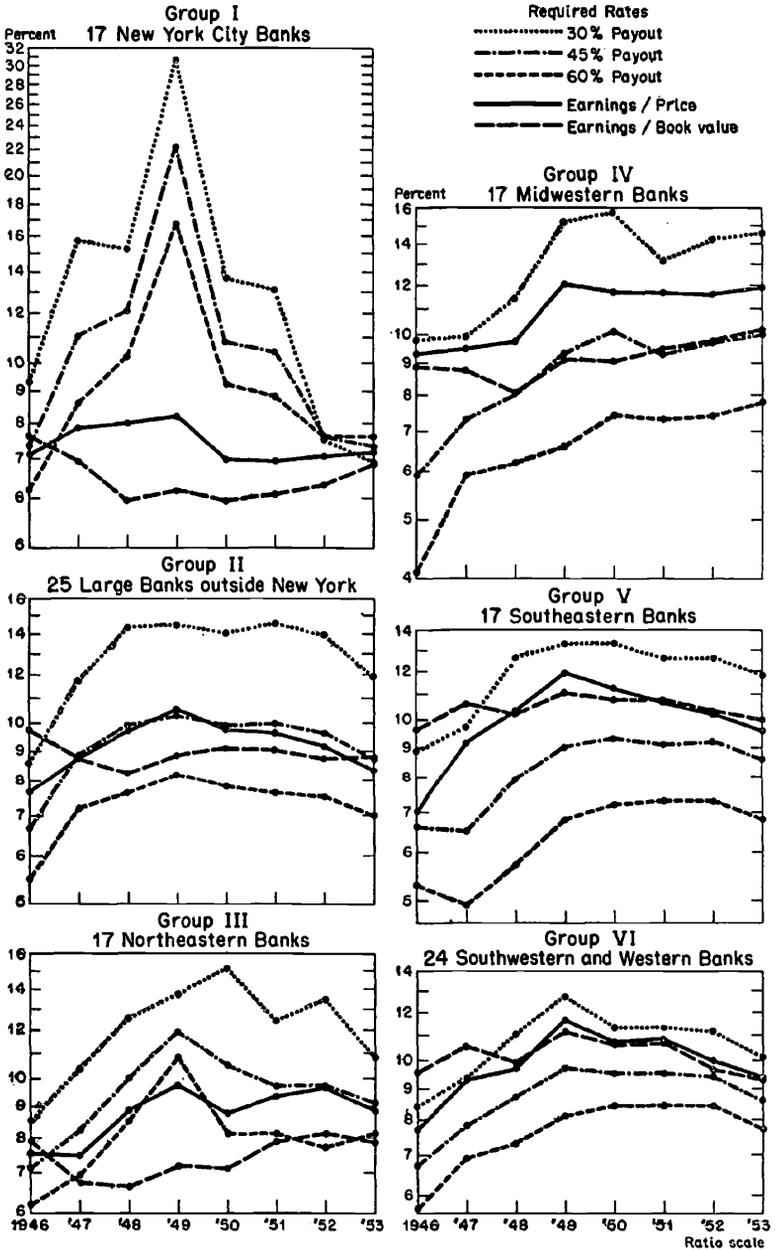
and the comparison shows that the required rate with  $D/E$  constant is much closer to the average  $E/B$  and the average  $E/P$  than is the required rate with  $D/B$  constant. This, of course, is normal, for a change in earnings would be expected to exert a greater effect on price when it is accompanied by a change in dividends in the same direction. The comparison also shows that both required rates are actually less than the average  $E/P$  and the average  $E/B$ , a result attributable to the favorable market for bank stocks in early 1953. At that time the stocks of the twenty-five banks outside New York were selling slightly above their book value — about 5 per cent.

The several panels of Chart 5 provide a historical view of the required rates of return and related series for the various groups of banks. Specifically, each chart contains: three estimates of the required rate, one corresponding to 60 per cent payout, one to 45 per cent, and one to 30 per cent; the earnings/price ratio; and the actual rate of return on capital,  $E/B$ . The first four of these series reflect the behavior of the market, and measure in one way or another what the market expects bank capital to earn. The fifth series,  $E/B$ , measures bank operating performance — that is, what bank capital actually earns. Naturally, it is the relation of market expectation to actual bank performance that determines the ease or difficulty of raising additional bank capital in the security markets.

Between early 1946 and early 1949 the general direction of stock prices was sharply down. Bank stock prices declined likewise, and the inevitable result was a substantial rise both in the earnings/price ratio and in the required rates of return. This trend comes out consistently in all panels of Chart 5. Over the same period, however, the trend of earnings was mixed, some groups of banks showing increases, others showing a decrease or no change. But even in the groups showing substantial increases — notably V and VI — the amount of increase appears to have been insufficient to prevent at least some price deterioration. Specifically, the following changes occurred in the six groups between 1946 and 1949:

### CHART 5

Average Ratio of Earnings to Price, and of Earnings to Book Value, and Estimated Rate of Earnings Required to Support Stocks at Book Value under Assumed Payout Ratios, for Six Groups of Banks, 1946-1953



Group	Price <sup>a</sup>	Earnings <sup>a</sup> per share	Required rate (45% payout)	E/P	E/B
I	-22%	-11%	+204%	+16%	-19%
II	-22	+6	+55	+38	-9
III	-23	0	+68	+30	-9
IV	-5	+22	+58	+29	+3
V	-17	+39	+36	+69	+15
VI	-11	+33	+45	+39	+16

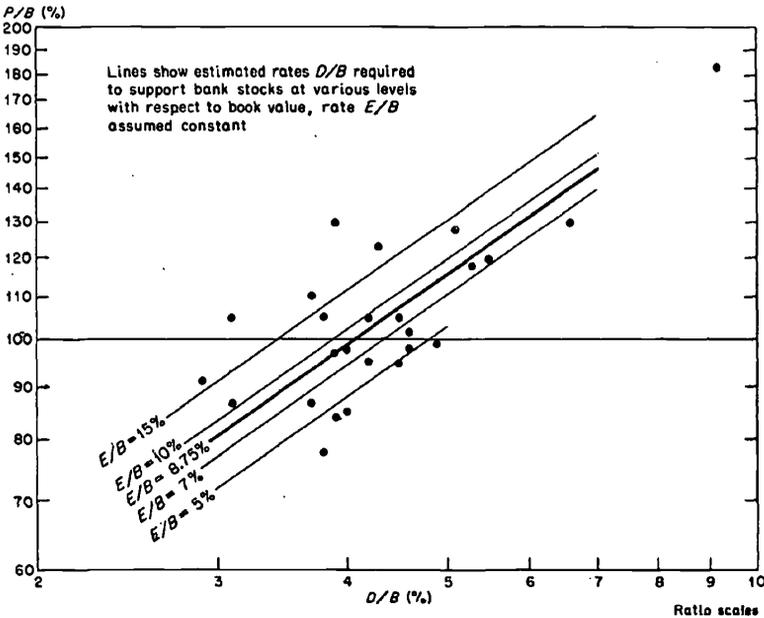
<sup>a</sup>The percentage changes in price and earnings per share have been determined from the figures in Table 3 after adjustment for stock dividends and splits.

### The Rate Paid on Capital

The ratio of dividends to capital,  $D/B$ , required to support bank stocks at book value can be estimated from the table of weights much as the required rate of earnings was estimated. The process is illustrated in Chart 6, which contains five trend lines, each repre-

CHART 6

Relation between Ratios of Dividends to Book Value and of Price to Book Value for Stocks of 25 Large Banks outside New York, Early 1953



senting a specified rate of return,  $E/B$ . As in the previous charts, the heavy line represents the average, and the point where this line crosses the 100-per-cent-of-book-value level is the required rate of dividends for banks outside New York with average rates of return in 1953: that is, with  $E/B = 8.75$  per cent.

The setup of Chart 6 was designed for the solution of a practical problem, though the solution thus obtained may be rough at best. The individual banker has more control over the dividend rate than he has over the earnings rate, since the latter depends upon so many factors that are beyond his control — the yield on government bonds being a good example. Therefore, the individual banker operating under a more or less fixed rate of earnings might still be faced with the need of choosing a dividend rate to achieve some objective. Suppose, for the sake of argument, that the banker earns 7 per cent on capital and wishes to set the dividend high enough to establish the price of his stock at 30 per cent above book value. According to Chart 6 the required dividend rate is about 6.3 per cent, for this is the point where the 7 per cent line crosses the 130 per cent level.

Now there are several reasons why this procedure requires cautious interpretation, and two of them must be mentioned. The first is fairly obvious and stems from the fallibility of the weights, which represent, at best, a hypothetical average bank. Decisions concerning dividend policy are necessarily made for operating banks, and these may differ from the hypothetical average. The second reason for caution is that the estimated required dividend rate, 6.3 per cent of book value, constitutes 90 per cent of the assumed 7.0 per cent earnings rate — falling far outside the limits of experience in Table 5 where the average dividend is about 50 per cent of earnings and the dividends for individual banks range from about 34 per cent to about 62 per cent. None of the lines in Chart 6 are extended beyond the point of 100 per cent payout; but the 5 per cent and 7 per cent lines are extended right up to this point, even though estimates for such extreme payout ratios are especially questionable.

### *Averaging the Rate Earned and the Rate Paid*

The idea of averaging earnings and dividends in attempts to explain security values seems to have originated with Graham and Dodd, who developed the formula<sup>2</sup>

<sup>2</sup>Benjamin Graham and David L. Dodd, with the collaboration of Charles Tatham, Jr., *Security Analysis*, 3rd edition, McGraw-Hill, 1951, p. 454 *et seq.* Graham and Dodd give the formula in the form  $\text{Value} = M (D + \frac{1}{2} E)$ , but the form presented here shows more clearly its nature as a weighted average.

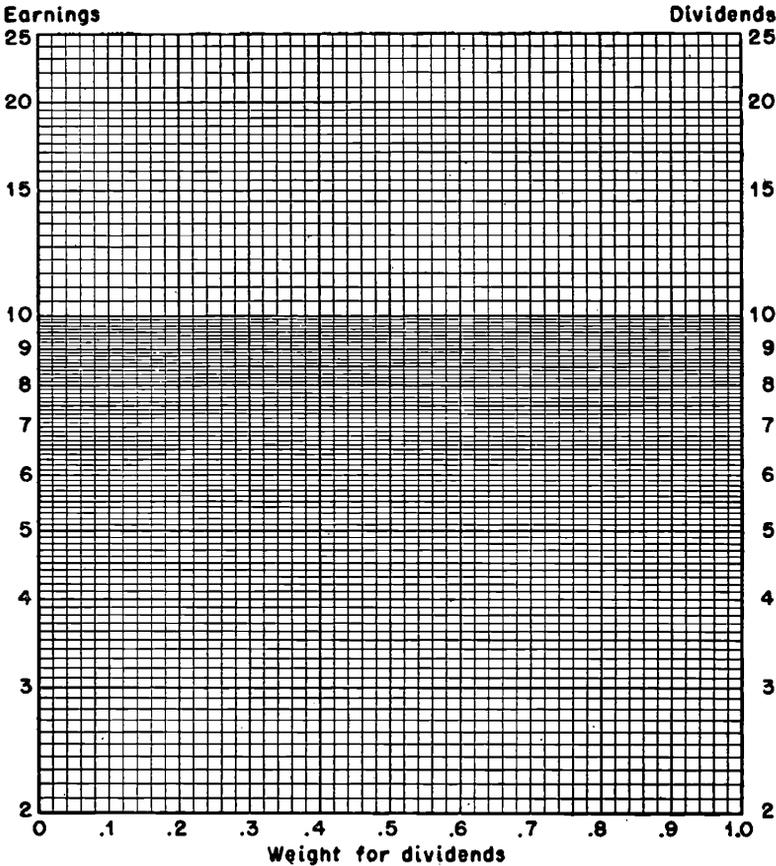
$$\text{Value} = \frac{4}{3} M (0.75 D + 0.25 E)$$

in which  $(0.75 D + 0.25 E)$  is a weighted average of earnings and dividends and  $\frac{4}{3} M$  is a suitable multiplier – similar to the  $P/E$  ratio, except that it applies to the combination of dividends and earnings instead of merely to earnings.

To derive weighted averages of earnings rates and dividend rates from the weights of Table 2, two procedures are necessary. First, the weights for earnings and dividends have to be adjusted to add to 1.00, which is easily arranged by computing the quantities  $e/(e + d)$  and  $d/(e + d)$ . Second, the adjusted weights have to be

### CHART 7

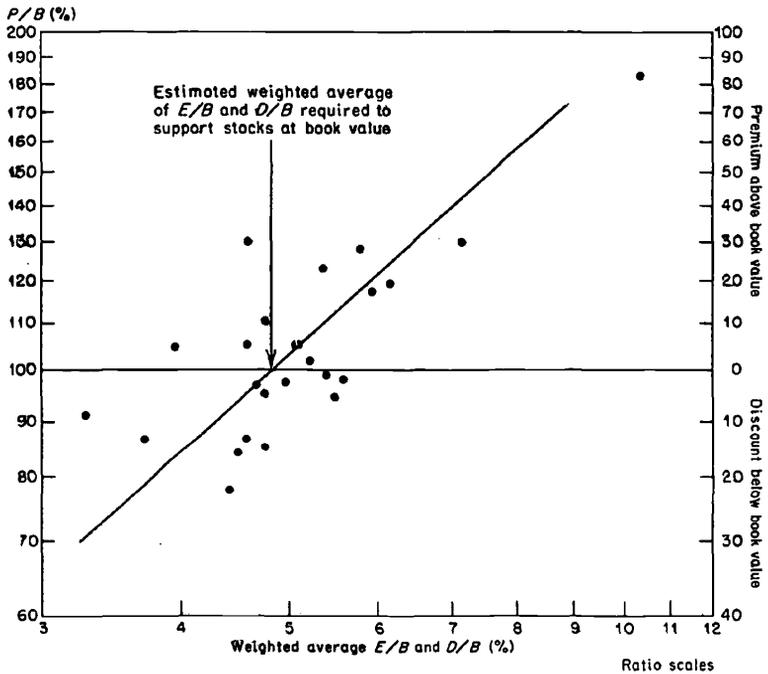
Calculator for Averaging Earnings and Dividends



applied to concrete numbers, a less simple procedure since the weights are geometric and the averages implied by them should be geometric as well. Ordinarily geometric averages are computed by extracting logarithms, but in this problem a suitable approximation can be derived from Chart 7. To illustrate, let us suppose we are required to find the weighted average of a three dollar dividend and a five dollar annual earnings rate, using the weights of the twenty-five banks outside New York in 1953. First the weight for dividends

### CHART 8

Relation between Ratio of Price to Book Value and Weighted Average of  $E/D$  and  $D/B$  for Stocks of 25 Large Banks outside New York, Early 1953



is adjusted from the formula  $0.70 / (0.70 + 0.21) = 0.77$ . Next, a straightedge is laid across Chart 7, connecting 5.00 on the left margin and 3.00 on the right. The point where this line crosses the vertical at 77 per cent is the required average, approximately \$3.71. The procedure works equally well for rates of earnings and dividends on capital — say  $E/B = 5.0$  per cent and  $D/B = 3.0$  per cent. Aver-

ages were thus determined for all of the twenty-five large banks outside New York in 1953, and the results are illustrated in the scatter diagram of Chart 8. The trend line indicates that the required average of  $D/B$  and  $E/B$  is about 4.8 per cent.

*Indifference Relationships between Dividends and Earnings*

Behind the idea of averaging earnings and dividends is the implicit assumption that all combinations having the same weighted average will exert the same effect on price. Thus, given the adjusted weights of 0.23 for earnings and 0.77 for dividends, the required weighted average of 4.8 estimated in Chart 8 might represent any of the following combinations

$D/B$	$E/B$
4.8%	4.8%
4.5	6.0
4.2	7.6
4.0	9.0

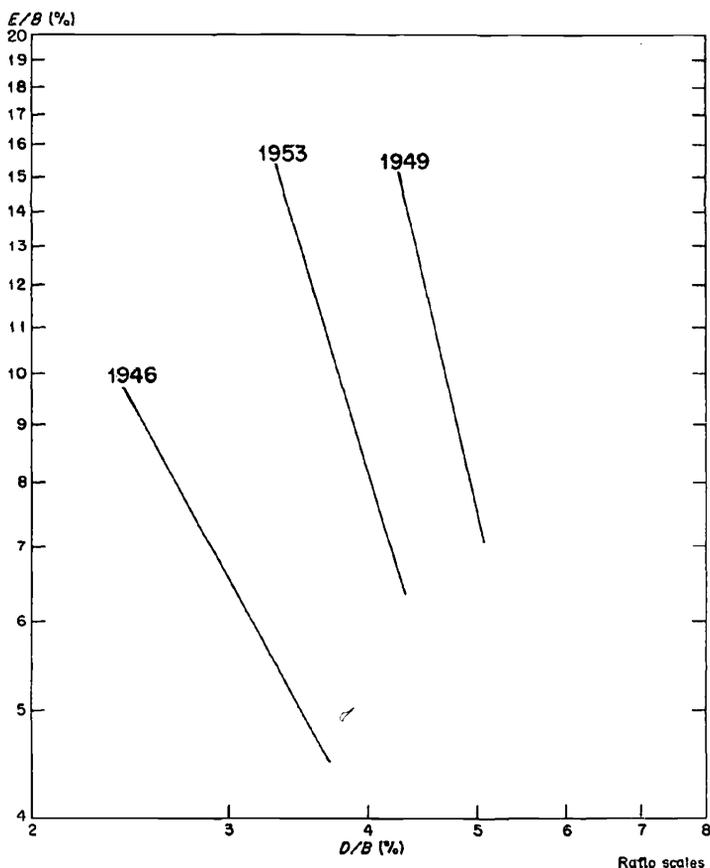
These and all other such combinations — which can be obtained by laying a straightedge across Chart 7 so that it passes through 4.8 per cent at the weight 0.77 — will lie along a straight line plotted on double logarithmic graph paper. This line, designated 1953, appears on Chart 9 along with two similar lines representing the group II banks in early 1946, near the top of the wartime bull market, and in early 1949, near the bottom of the subsequent bear market. A comparative set of lines for group III banks appears in Chart 10.

To the extent that they are reliably located, the lines on Charts 9 and 10 answer the basic question posed in the introductory chapter: If bank stocks are to sell at book value, what rate must be earned and paid on capital? The lines are, presumably, sufficiently reliable to indicate the order of magnitude of the rise in required rates attributable to the 1946-49 bear market — and likewise the order of magnitude of the fall in required rates accompanying the subsequent bull market up to 1953. But the slopes of the lines, which are determined by the relative weights of earnings and dividends, are certainly tenuous. Although the marked and rather consistent differences in slopes between groups II and III are probably the manifestation of a genuine variation in the importance of dividends versus earnings, the rather small differences observed within the two groups

are perhaps better explained as mere random variation. (For further discussion see Appendix A.) In some of the groups not illustrated in Charts 9 and 10, large differences were observed in the slopes from year to year; but these appeared highly erratic in character and provide no sound basis for measuring changes in the importance of earnings versus dividends.

CHART 9

Estimated Combinations of Earnings and Dividends Required to Support Stocks at Book Value, 25 Large Banks outside New York, Early 1946, 1949, and 1953

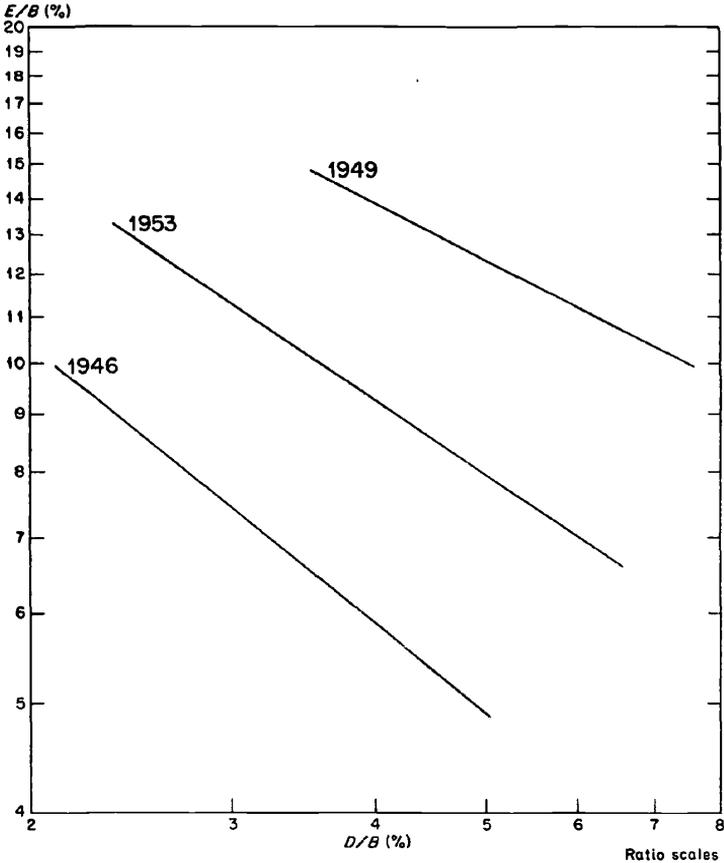


The lines in Charts 9 and 10 exhibit some of the characteristics of indifference curves — which are familiar to theoretical economists — because all points along any one line represent combinations of earn-

ings and dividends to which the market is presumably indifferent. The common characteristics become more apparent, perhaps, when one of the lines is replaced by a family of lines.<sup>3</sup> From Chart 8 a schedule was estimated to describe the relationship between the ratio  $P/B$  and trend-line values of the weighted average rate of return; it is shown on the next page.

CHART 10

Estimated Combinations of Earnings and Dividends Required to Support Stocks at Book Value, 17 Northeastern Banks, Early 1946, 1949, and 1953



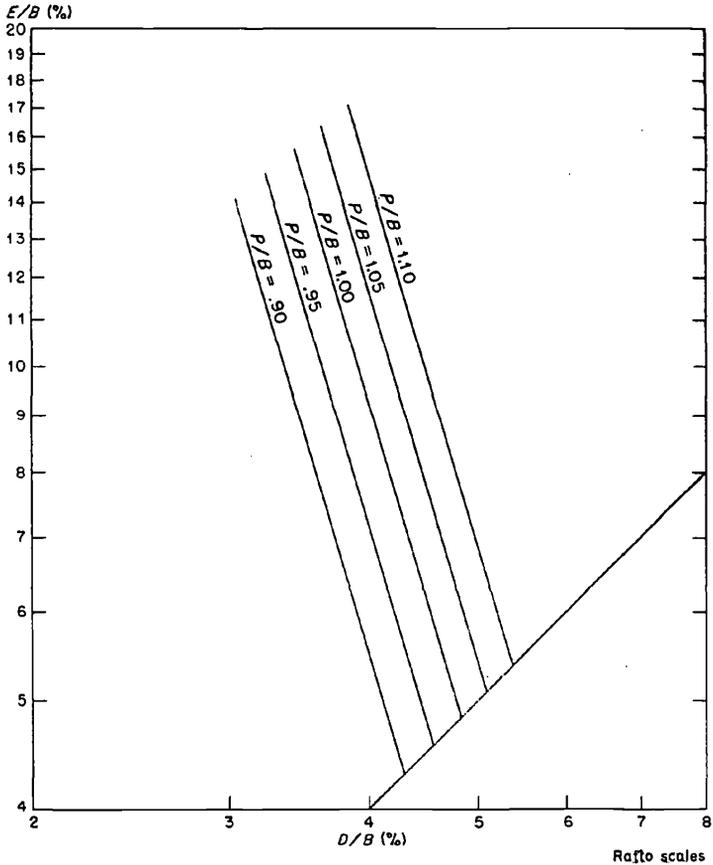
<sup>3</sup>In fact, if it should be assumed that equation (1), Appendix A, defines a utility function, then the curves in Chart 11 would represent bona fide indifference curves.

<i>P/B</i>	Average of <i>D/B</i> and <i>E/B</i>
90%	4.3%
95	4.6
100	4.8
105	5.1
110	5.4

Then Chart 11 was constructed from this schedule. This suggests that we may broaden the basic question posed by the study, as fol-

### CHART 11

Estimated Combinations of Earnings and Dividends Required to Support Stocks at Book Value and Various Premiums and Discounts, 25 Large Banks outside New York, Early 1953



lows: What rate must be earned and paid on capital in order to support bank stocks at book value — or at specified premiums and discounts? Chart 11 provides a rough answer at least.