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Volume Title: Bank Stock Prices and the Bank Capital Problem

Volume Author/Editor: David Durand

Volume Publisher: NBER

Volume ISBN: 0-87014-368-9

Volume URL: <http://www.nber.org/books/dura57-1>

Publication Date: 1957

Chapter Title: Front matter, table of contents

Chapter Author: David Durand

Chapter URL: <http://www.nber.org/chapters/c4624>

Chapter pages in book: (p. -17 - 0)

**Bank Stock Prices
and the
Bank Capital Problem**

DAVID DURAND

OCCASIONAL PAPER 54

Financial Research Program

**NATIONAL BUREAU OF ECONOMIC RESEARCH, INC.
1957**

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Typography by Oscar Leventhal, Inc.
Printing and Binding by the Basso Printing Corporation

Library of Congress catalog card number: 57-8397

Price: \$1.00

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ACKNOWLEDGMENTS

The adequacy of the capital of commercial banking institutions has been for some time a subject of keen interest, and has been examined from a number of angles. In this study, Dr. Durand seeks to clarify what is perhaps the major question in these discussions, namely, why bank stocks often sell at a discount from their book value and thus affect adversely a bank's chances of obtaining additional capital funds on reasonable terms through the sale of additional stock.

Dr. Durand's study was undertaken in May 1952 as a regular part of the National Bureau's Financial Research Program and was completed after his joining the faculty of the Massachusetts Institute of Technology. It was financed by a generous grant of funds from the Association of Reserve City Bankers.

For aid in assembling the large volume of statistical data required, thanks are due to the Board of Governors of the Federal Reserve System, to many of the individual banks covered by the study, and to Moody's Investor's Service. Albert Ehinger and Fred Marcus provided diligent assistance in processing these data, and Martha Jones performed much of the necessary machine tabulations. Bettina Hartenbach edited a first draft of the manuscript; Mary Phelps edited the final draft and saw it through press. H. Irving Forman drew the charts.

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March 1957

FOREWORD

One of the most widely discussed problems in American banking in recent years has been the long, almost uninterrupted decline in bank capital ratios. The broad facts concerning this trend are well known and need be related here only very sketchily. When the national banking system was established, just after the middle of the nineteenth century, the capital accounts of commercial banks amounted to roughly 30 per cent of bank assets. This situation continued substantially unchanged during the remainder of the century, but a decline in capital ratios began around 1900 which brought the average ratio for the banking system as a whole to 10 per cent in 1940. At the end of 1953, after a brief and minor reversal of movement, the average ratio of capital to assets for all banks stood at just over 7 per cent, and it is at this point that we find ourselves in 1957.

A number of important questions may be asked concerning this trend in bank capital ratios. What caused it? Is it likely to be carried still further? Could it be reversed? What is its significance to American banking and to our economy generally? The present study is not designed to answer all of these questions; indeed, some of them could not be answered conclusively by any research undertaking. Dr. Durand's study does, however, go to the center of several of them. But before explaining the purpose of his research, it may be useful to comment briefly on the last of the questions, namely, the economic significance of the decline in bank capital ratios.

Almost every route that one takes in exploring the economic significance of the downward trend of bank capital ratios leads to what is, in fact, the central question in this area: whether bank capital can be regarded as "adequate." Perhaps the most fundamental aspect of the question is whether there is enough capital in banking institutions to absorb losses that may reasonably be expected to occur in the future, without impinging on the resources needed to cover liabilities to depositors. If bank capital were adjudged inade-

quate in that sense it would imply that the banking system had been critically weakened by the decline of capital ratios, a circumstance that would have obvious significance for our economy.

Another aspect of the question relates to the effect of declining bank capital ratios on the willingness of banks to assume risks. Presumably this willingness would be reduced to the extent that banks regarded their capital as inadequate, with the practical result that concerns presenting the higher degrees of risk would tend to be eliminated from the company of eligible bank borrowers. At least the terms on which such firms might borrow would tend to become more severe. Thus, any tendency reducing banks' willingness to take risks would seriously weaken the forces making for economic growth.

Whatever may be the effect of declining bank capital ratios on the willingness of banks to assume risks, which turns partly on psychological considerations, it is inescapable that the capacity of banks to absorb losses is reduced if capital ratios fall and risk exposure remains the same. But has exposure to risk remained the same? We know that the structure of commercial bank assets has not been static. On the contrary, bank assets have changed radically: for a time, mainly in the direction of an increase in the proportion of those which, for one reason or another, carry little or no risk; more recently, risk assets have assumed increased prominence. Can it be said, then, that there has been no impairment of the adequacy of bank capital?

This question has been treated extensively in the financial press, and a certain amount of systematic factual research has been done upon it. Yet the answer is still in doubt. Clearly, the proper approach to finding an answer is to make a judgment — and ultimately it can be no more than a judgment — as to the shrinkage in value to which various classes of assets are potentially subject and to compare available capital with the potential contraction of asset values. Even so, any answer that is found will be subject to a wide margin of error since it must rest on forecasts of an uncertain future and estimates based on an imperfect knowledge of the past.

But the situation is not hopeless. Fortunately, financial research in the last fifteen years has added materially to our knowledge of loss experience and future research should augment it. Though we would be deceiving ourselves if we thought that a definitive answer to the question whether bank capital is adequate can ever be reached, systematic studies of loss experience are the one sure way to improve our judgments concerning it. Only on the basis of such studies can

we satisfactorily appraise the significance of changes in bank capital ratios.

In any case it is clear that if bank capital is adjudged inadequate at its present levels, major efforts may be required to attract sufficient new capital into the banking business; and even if the present level is considered just right (or barely adequate), substantial amounts of new capital may still be required merely to keep pace with the secular increase in bank deposits. Here the present study finds its usefulness. When it was undertaken, in 1952, bank deposits were growing at the rate of about 5 per cent per year, and the problem of expanding bank capital at a similar rate was forbidding. Bank earnings were not high enough to provide the indicated funds and leave much of a margin for dividends. Moreover, many bankers were loath to issue new stock, since so many bank stocks were selling below book value. In short, bankers found themselves in an anomalous position: they were operating an industry with proven growth potential, but were having difficulty raising capital because their stocks did not command the favored position of growth stocks.

Specifically, the study experiments with applying systematic statistical methods, notably multiple regression, to the analysis of the cost of bank equity capital, which may be roughly defined as the rate of return necessary to attract new equity into the banking business in quantities sufficient to keep pace, in the long run, with the secular increase in bank deposits. But since the cost of bank capital is complex and elusive, the study makes no pretense either that this rough definition is anything more than suggestive, or that the cost of bank capital can actually be measured. As a practical objective, it attempts to measure the rate of return on bank equity required to support bank stocks at book value, on the grounds that this is an important aspect of the cost of bank capital and that it can be more readily handled in statistical analysis than can the cost of capital itself. Even this limited objective presents problems of measurement, as Dr. Durand points out, and his estimates of the required rate of return are subject to a wide margin of uncertainty.¹ Nevertheless, the study breaks new ground and sheds much new light on a critical economic problem in its analysis of factors influencing the availability of capital to banking institutions.

¹Much of the present study is devoted to considering just how reliable such estimates can be. In this connection, see also two other papers by Dr. Durand: "Joint Confidence Regions for Multiple Regression Coefficients," *Journal of the American Statistical Association*, Vol. 49 (1954), pp. 130-46; and "Bank Stocks and the Analysis of Covariance," *Econometrica*, Vol. 23 (1955), pp. 30-45.

Dr. Durand was able to estimate, for the eight years 1946 through 1953, the relative importance or "weight" of three factors that affect bank stock prices — namely, book value, dividends, and earnings — and from these weights he was able to estimate the effect that earnings rates and dividend rates exerted on the ratio of price to book value. One would expect, of course, that other factors such as size of bank, the ratio of risk assets to deposits, or the rate of growth in earnings might also affect stock prices; and even though their influence proved too subtle — or too slight — to be revealed by fairly refined statistical techniques, one cannot dismiss them entirely. Dr. Durand expected that growth would certainly have some effect on bank stock prices, and he made several attempts to measure it. The fact that all these failed excites one's curiosity.

How can growth, which has become so important to so many investors at the present time, be yet so elusive that its effects are undetectable by systematic statistical methods? Can it be that bank stocks are a peculiar breed that escapes the attention of the ordinary growth-stock-minded investor? Indeed, Dr. Durand argues on theoretical grounds (in the face of inadequate statistical evidence) that a rate of return high enough to support a stock at something more than book value is well nigh essential to make that stock attractive as a growth stock. During the period studied, bank stocks were selling for the most part at or below book value; but since 1953 bank stocks have risen appreciably, and prices substantially above book value are not uncommon in recognized growth areas. The challenging problem of devising an empirical measure for the relative effect of growth on bank stock prices remains. One contribution of the present study is to have cleared away much of the underbrush, posing clearly both the problem and the difficulties it raises.

Factually, therefore, the study is preoccupied with the analysis of the three factors book value, dividends, and earnings, whose effect on bank stock prices could be estimated statistically. The problem was to assign to each of these factors its proper weight as a determinant of market value. The estimated weights, presented in Table 2, bring out the following facts: First, the influence of earnings, dividends, and book value on market price varied appreciably from one group of banks to another. Book value was by all odds the most important price-determining factor for the stocks of seventeen New York City banks. On the other hand, dividends took first place for three other groups of banks: twenty-five large banks outside New York, seventeen midwestern banks, and seventeen southeastern banks. Second, the weights for earnings, dividends, and book value

for the several groups differed from one year to another. These variations were erratic and provide no basis for generalizations concerning significant shifts in the market's evaluation of the three factors.

In Chapter 3 the author exploits the weights for earnings, dividends, and book value to estimate what rate of earnings and dividends was required to support bank stocks at book value. For an understanding of the results, one technical point is crucial. Ordinarily, one assumes, the price of a stock is affected by the dividend rate, and this means that the rate of earnings required to support a bank stock at book value depends somewhat on the proportion of earnings paid out. Thus, Dr. Durand estimated not just a single rate of return, but a schedule of rates for various payout ratios. The schedule below, which relates to twenty-five large banks outside New York in early 1953, is an example:

For a payout ratio of	The required rate of earnings on capital to sustain market price at book value was roughly
70%	6.3%
60	7.1
50	8.3
45	9.0
40	9.7
35	11.0

The above estimates, showing a required rate of earnings highly sensitive to the payout ratio, apply to a group of stocks where the weight for dividends was substantially higher than average and very much higher than the weight for dividends in the New York City group. On the average, the schedule of required rates would show less sensitivity to the payout ratio.

By similar means, the rate of dividends required to maintain bank stocks at book value can also be estimated. As one would expect, it ordinarily depends on the rate of return earned on capital. The following schedule, for the group of large banks outside New York City in early 1953, is illustrative.

When the ratio of earnings to book value was	The ratio of dividends to book value required to hold price at book value was approximately
5%	4.8%
7	4.3
8.75	3.9
10	3.8
15	3.4

The estimates of earnings required to hold market price at book value are put to an interesting and important use where the author shows how, in the years 1946-1949, the tendency for "required" earnings to rise while "actual" earnings were falling, or for the "required" earnings to rise more rapidly than actual earnings, caused the prices of bank stocks to fall to larger and larger discounts from their book value. Chart 5, in which the relationships between required and actual rates of return are pictured, give a graphic explanation of why bank stocks weakened progressively from 1946 to 1949 and recovered subsequently.

For several groups of banks, the relationship between required rates of return, even at relatively low payout ratios, and actual earnings ratios was fairly close in 1946, widely separated in 1949, and fairly close again in 1953. It will be recalled that 1946 and 1953 were relatively good years as regards bank stock prices, and congenial times in which to acquire additional funds through the sale of stock; conversely, 1949 was an unfavorable year in which to accumulate capital through public sale of stock. These findings give quantitative substance to the often repeated statement that earnings are at the basis of the problem of bank capital.

R. J. SAULNIER

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