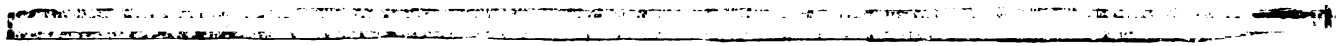

ABSTRACT

A MULTIVARIATE ANALYSIS OF THE FINANCIAL CHARACTERISTICS OF LARGE COMMERCIAL BANKS UTILIZING DEBT CAPITAL

By

Eugene F. Dunham, Jr.

The purpose of this research is to compare and analyze financial characteristics of large commercial banks containing debt capital relative to those banks financed with all equity. In December, 1962 the Comptroller of the Currency eased national bank laws and allowed debt securities to be issued in non-distress situations. In the ten year period 1962-72 over six billion dollars of notes and bonds were sold by the largest commercial banks. The response to the easing of the law, though, was not uniform. Many large banks did not issue debt securities. This study examines and contrasts those banks who issued debt against those that used only equity financing.

The research question tested whether there were significant differences between the financial characteristics of banks containing debt capital and those having all equity. Related to the central question of differences were the following questions:

A. Do the asset and liability structures differ in banks containing different sources of capital?

B. Do different capital structures indicate differences in earnings, dividend policy, or stock market prices?

The study reviewed the sample of large commercial banks by their 1970 asset size that ranked in the top 150 in the country. From that

group, 88 national and state banks were selected for analysis with data obtained from Compustat Tapes. The selection criteria was based on the following: (1) banks in the non-debt capital sample had no debt for the period 1963-72; (2) debt capital banks had issued debt prior to 1970 and it was still outstanding for 1971 and 1972; (3) complete data for every variable reviewed.

To add greater sensitivity to the analysis of the impact of debt, the population of debt banks were further classified by levels of debt in their capital structure. The 88 banks therefore settled into four classes (levels) as follows:

Number of Banks	Level	Class	Definition
23	Non-Debt	(0)	No debt ever issued
25	Low Debt	(1)	Less than 15% debt/total capital funds
24	Moderate Debt	(2)	15% to 30% debt/total capital funds
16	High Debt	(3)	Greater than 30% debt/total capital funds

To examine the impact of debt capital on the financial characteristics of the firm a multivariate analysis of variance (MANOVA) covering the period 1971 and 1972 was used. The analysis was based on the following 12 variables:

V_1 $\frac{\text{Net Current Operating Income}}{\text{Average Total Assets}}$

V_2 $\frac{\text{Net Current Operating Income}}{\text{Average Total Equity}}$

V_3 $\frac{\text{Average Total Loans}}{\text{Average Total Assets}}$

V_4 $\frac{\text{Average Total Loans}}{\text{Average Total Deposits}}$

V_5 Dividend Payout Ratio

V_6 Dividend Growth

V_7 $\frac{\text{Average Market Price}}{\text{Net Current Operating Income}}$

V_8 $\frac{\text{Short Term Debt}}{\text{Average Total Capital}}$

V_9	Equity Growth	V_{11}	Average Deposit Growth
V_{10}	$\frac{\text{Average Total Capital}}{\text{Risk Assets}}$	V_{12}	Average Loan Growth

These variables were used because they reflect financial qualities and characteristics of banks. Conceptually, time and debt/non-debt are viewed as the independent variables with the ratios and indexes as dependent variables.

The multivariate test developed significant differences at a critical level of .05 for Level (2) and Level (3) banks. Level (1) banks' F ratio was not sufficient to meet that cutoff. The tested variables showing significant differences proved to be: return on assets (V_1); return on equity (V_2); loans to deposits (V_4); dividend payout (V_5); amount of short term debt to total capital (V_8); and total capital to risk assets (V_{10}). The six variables showing differences were not all significant for each level of debt. Specially, for Level (2) banks V_1, V_8, and V_{10} contributed to the significant F ratio, and for Level (3) banks, V_1, V_2, V_4, V_8 and V_{10} contributed to the very high F ratio.

The study concludes that:

1. As the amount of debt increases in the capital structure of the bank, favorable financial leverage is observed.

2. As banks increase their use of debt capital they reduce their use of short term debt. Correspondingly, those banks containing all equity have significantly greater amounts of short term debt.

3. The traditional capital ratios of long term debt banks are significantly improved by the injection of long term debt capital.

4. Stock prices of all banks are almost identical regardless of their capital structure.

Stronger conclusions are difficult to state. It appears, for example, that as debt capital increases, banks tend to increase their dividend payout. Whether this increased dividend payout increases stock prices is difficult to state. Previous studies indicate a high correlation between greater stock prices (shown by higher P/E ratios), but this research failed to support that view.

The question of dividend payout and stock prices needs more investigation as well as the following: continued work in the area of the cost of capital; the question of low deposit growth; the debt decision; and the role of non-deposit debt management in commercial banks. The latter area appears highlighted by this research. An examination of the debt management decision would include, it seems, an analysis of the supervisory constraint (i.e., capital adequacy); risk considerations between maturities of debt issues; and market (depositors and investors) perception of risks of debt policies particularly in light of large bank failures since 1973.

A MULTIVARIATE ANALYSIS OF THE FINANCIAL CHARACTERISTICS OF LARGE COMMERCIAL BANKS UTILIZING DEBT CAPITAL

By

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A MULTIVARIATE ANALYSIS OF THE FINANCIAL CHARACTERISTICS OF LARGE COMMERCIAL BANKS UTILIZING DEBT CAPITAL

CHAPTER I

INTRODUCTION

With the expansion of the bank assets and deposits during the last decade continuing at an historically fast rate, capital needs have become a concern of both bank management and regulatory agencies.[1] Aggregate data for the banking system for the last 60 years continue to show a persistent decline in traditional bank capital ratios, such as capital to deposits; capital to total assets, and capital to risk assets.[2] The result of this expansion, particularly over the last decade, has been to lead large banks into capital ratio positions lower than traditionally acceptable. In addition, in reviewing standard ratios like total capital to total assets (particularly if debt capital is excluded from the calculation) the decline in equity capital is even larger.[3]

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[1]Wesley Lindow, "Bank Capital and Risk Assets," The National Bank Review, vol. 1, no. 1 (September, 1963), pp. 29-41.

[2]Ibid., p. 30.

[3]Douglas V. Austin, "Senior Debt and Equity Securities," The Bankers Magazine, vol. 157, no. 1 (Winter, 1974), pp. 73-84.

Purpose and Significance of Study

This study will examine the results of the debt and non-debt decisions via analysis of selected financial ratios and indexes in a multivariate research design. The null hypothesis to be tested is:

> there are no significant differences between the financial characteristics of banks containing debt in their capital structures than those having all-equity capital structures.

The null hypothesis is based on the position that debt banks do not have a significantly different financial profile as suggested by opponents of debt and, except for the different debt decisions, operate their banks with policies comparable with non-debt banks. To examine the hypothesis selected financial characteristics of large commercial banks containing debt capital will be compared with large commercial banks financed totally with equity. These financial characteristics will be represented by a group of 12 ratios and indexes analyzed in a multivariate research design. As Roy Foulke has said, "Every managerial policy, or absence of managerial policy is reflected somewhere in the figures in the balance sheet, in the income statement, or in the reconciliation of surplus."[1] It then is logical, therefore, that if selected ratios and indexes are developed and analyzed, a profile of characteristics of a firm (or group of firms) and their managerial decisions can be developed.

In developing a framework to answer the research hypothesis, the study effectively becomes exploratory in nature. No one ratio or index

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[1]Roy Foulke, Practical Financial Statement Analysis, 6th ed. (New York: McGraw-Hill Book Co., 1968), p. 4.

can adequately fill the role required to test the research question. Therefore, as part of this research questions relating to asset and liability mix; loan activity; earnings; dividend policy; and stock market prices are examined and analyzed.

By reviewing changes in the above variables correlated to the capital structure of banks (i.e., those with debt versus those with all equity structures) a profile of large commercial banks in each class appears. These profiles, when compared and analyzed, will supply the answer for the research hypothesis.

For instance, from 1960 to 1969 total debt capital for all banks utilizing senior securities rose as a percent of capital from 6.4% to 21.2%.[1] In addition, long term debt rose from 22 million dollars in 1961 to over 4 billion dollars by 1972 for all insured commercial banks.[2] These debt issues were made by the large banks (over 1 billion dollars in assets) and have resulted in a blended capital structure for large commercial banks. Since 1962 it can be observed that the industry moved from a position of almost 100% equity capital to a mix of debt and equity.

Since the Comptroller of the Currency's ruling in late 1962,[3] national banks have been allowed to sell debt securities subordinated to deposits. Soon after, state banks were also given the option. The

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[1]Ibid.

[2]Federal Deposit Insurance Corporation, Annual Reports (1960-1972) Washington, D.C.

[3]James J. Saxon, "Corporate Practices and Procedures of National Banking Associations." Letter to the presidents of all national banks, December 20, 1962. (Mimeographed)

debentures sold usually fell into two maturity ranges: short term of 7 to 8 years, or long term of 20 to 25 years. The original ruling on debt is silent on the subject of maturity but almost all issues settled into time periods as described above. Since 1970, though, there has been no doubt as to the minimum maturity. In that year the Federal Reserve Board extended coverage of its Regulations D and Q to include debt issues of less than seven years or less than five hundred dollars.[1] There is no legal limit as to maximum maturity, but market acceptance would appear to preclude a term greater than 25 years.

According to observers of the debt decision made in 1962, the basic reasons for the Comptroller's approval were:[2]

1. The desire to build capital in the banking system. Long term debt would accomplish that goal and also give flexibility to bankers in capital financing.

2. The subordinate status of the debt and its long maturities would give banks breathing room in meeting capital needs.

The decision appears to be based upon the opinion that banks need more capital and, in light of continued forecasts of banking growth, all possible means of raising capital should be made available. Unfortunately, debt capital carries with it a fixed interest cost. Therefore, the resulting debate on the debt capital question usually

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[1]Regulations D and Q cover the definition of what is a savings or time deposit and also covers the amount of interest to be paid on those deposits. See Board of Governors of the Federal Reserve System, Federal Reserve Bulletin, June, 1972.

[2]See Herbert Bratter, "Debentures: A New Way to Raise Capital," Banking, vol. 58 (February, 1964), pp. 59+; also, David C. Cates, "Bank Debentures, Leverage and Debt Capacity," Bankers Monthly, vol. 80 (November, 1963) and vol. 81 (December, 1963). In addition, communication with the Office of the Comptroller of the Currency and individuals there when the decision was made supports the above observation.

evolved around two points: (1) the potential for bond default (bankruptcy) or increased risk, and (2) the question of whether long term subordinated debt is really capital. Debt advocates believe that debt has sufficient "capital" traits that it can safely be viewed as almost equal to equity. Opponents simply scoff at that view and reject the notion of debt as capital. They appear to base their view of debt on the fact that it is not permanent and it has a fixed charge.[1]

Two points of view on debt played down or overlooked in the controversy of debt as capital cover the concept of debt as: (1) filling or bridging a need, and (2) the producing of positive leverage. Bridging is simply the act of using an intermediate term loan as a base to support further expansion and growth with repayment from the resulting increased income stream. As time passes the bank is replacing the debt with ever larger retained earnings generated from the use of debt. Of course, it is possible that the growth need originally faced was not "temporary" and the need for a bigger capital base continues, or it is possible that the banks might have been "insufficiently" capitalized prior to the debt issue.[2] If the need was not temporary, because of ever increasing growth or undercapitalization,[3] financial management would recommend permanent equity capital as a solution. Unfortunately,

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[1]See Chapter III for a detailed review of these issues.

[2]Stanley Silverberg, "Bank Debenture Financing: A Comparison of Alternatives," The National Banking Review, vol. 3, no. 1 (September, 1965), pp. 46.

[3]Undercapitalization is always difficult to define. Banks, because of their regulated industry, may face the question directly due to a regulating agency "deciding" they are undercapitalized. The result is some form of capital issue whether or not management believes it is valuable.

management may not believe (or admit) that equity is the best solution. Management may perceive the use of debt capital as being so "profitable" that the possible problem of long run (or continued) equity capital shortage fades into insignificance.

The question of profitability via leverage is easily seen with the following illustration of both financial leverage and capital leverage due to an undercapitalized position.[1] Assume two banks with deposits of one billion dollars each. Bank A has assets of 1,080 million and equity of 80 million; Bank B has 1,060 million of assets and 60 million of equity and is pressured by authorities for an increase in capital. Both banks sell $20 million of 20-year subordinated debentures. Their ratios of assets to equity change as follows: Bank A--13.5 times to 13.75. Bank B--17.6 times to 18.01. If Bank B had used $20 million of equity its ratio would have dropped to 13.5 times. The change in asset/equity ratios shows the potential of the leverage. As long as the bank earns more on its investments than the cost of borrowings it will increase earnings and the rate of return on its equity. In the undercapitalized situation Bank B's use of debt capital has given it even a further levered position.

The need for analysis of the role of debt capital in banks then appears both crucial and basic. Previous studies of debt capital appear to center on the evolution of debt capital, its effects as an ancillary or secondary variable, or the economics of issuing bank debentures.[2]

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[1]This example was suggested in Silverberg, op. cit.

[2]See, for example, David W. Cole, "Senior Securities in the Capital Structure of Commercial Banks," (Ph.D. dissertation, Graduate School of Business, Indiana University, 1965); Eugene F. Drzycimski, "A Study of the Determinants of Common Stock Prices and Price Relatives for a

These studies, besides not addressing themselved to the question of the impact (negative or positive) that debt capital has on the financial profile of a bank, are dated, with the principal research based on mid-60's data. All empirical research done on bank capital has concentrated almost solely on the question of capital adequacy; that question still remains unclear. This research proposed to add to the knowledge base by examining one portion of the capital question: the impact and use of debt capital. It is hoped that this baseline study will result in placing the debt capital question in a better perspective and give future bank capital studies, whether on capital adequacy or other areas, a more firm base.

The broad view behind this research is that modern and progressive bank management foresaw the rapid and continued growth of the banking industry. In their planning for the future they clearly perceived that to meet this growth they would require more capital, and jointly, the need for greater sources of funds. Many banks in seeking various sources of funds have actively utilized debt capital.

Research Design

Ratios and indexes are developed, as Myer states ". . . as its objective the formation of an opinion . . ."[1] The opinion in this

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Selected Sample of Large Commercial Banks," (Ph.D. dissertation, Department of Accounting and Financial Administration, Michigan State University, 1966); George C. Hawke, Capital Note Financing of Commercial Banks (Philadelphia: Investment Bankers Association and Wharton School of Finance and Commerce, 1965); and John J. Pringle, "The Role of Capital in the Financial Management of Commercial Banks," (Ph.D. dissertation, Graduate School of Business, Stanford University, 1972).

[1]John N. Myer, Financial Statement Analysis, 4th ed. (Englewood Cliffs: Prentice-Hall, Inc., 1969), p. 33.

research to be formed and then tested is whether banks using debt capital versus those using all equity capital have different financial characteristics. To test the question of "different" a multivariate analysis of variance (MANOVA) will be applied to 12 dependent variables represented by eight ratios and four indexes. The MANOVA test gives ". . . a rapid means of testing the null hypothesis that groups derive from common population."[1]

The variables selected are a priori selections based on generally accepted measures of financial characteristics of commercial banks.[2] Over two dozen ratios were reviewed prior to the selection of the twelve used as dependent variables in this research. The final selection process was based on the traditional measures used in the banking industry; basic ratio analysis as expressed in the finance literature; and a regression analysis used to filter out ratios with very low impact.

The study examined data for banks containing all-equity capital compared with data for banks containing debt capital. The possible effect of different levels of debt is then considered by expanding the research to classify banks by four levels of debt, as follows: no debt; low debt; moderate debt; and high debt.

It was felt that if debt was examined without regard to level, the

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[1]T. G. Connolly and W. Sluckin, An Introduction of Statistics for Social Sciences (New York: St. Martin Press, 1969), p. 154.

[2]See, for example, H. Crosse and G. Hempel, Management Policies for Commercial Banks, 2nd ed. (Englewood Cliffs, N.J.: Prentice-Hall, Inc., 1973). Further references are expanded upon in Chapter V. See Table 6 for a detailed breakdown of the variables.

results could be biased. Banks containing high debt capital levels could have significantly different characteristics than low debt capital banks. By examining debt by levels a more sensitive analysis is expected.

The research also explicitly examines time as an independent variable in order to assess the stability of the measured variables. Clearly, time affects the ratios used in this research. Banking development is not static. The MANOVA technique in this research is used to examine the possible interaction of time and the variables used to develop a financial profile. If interaction is present the analysis will become more difficult and the relationships present between debt and non-debt capital banks harder to pinpoint. If no interaction is observed the reliability and the ease of analysis is greatly increased.

Organization of the Dissertation

Chapter II will review the historical development of debt capital including the presentations from public hearings on bank debt capital where frequent and heated arguments were invoked. The problem of the identification of debt capital as "distress financing" is developed with the result that only recently has that stigma appeared to be dissolved in the minds of many bank officials. It is shown that the law allows substantial debt issuance; yet, regulatory agencies (and some bank management) appeared to discourage its use.

The reasons for this apparent dichotomy between the law and regulator attitudes is reviewed in Chapters III and IV via analysis of the literature and studies about bank capital. The qualitative reasons for and against the use of debt are reviewed and a position taken.

Chapter V reports on the statistical techniques used in this research design and reviews and explains the data base. The analysis

of the research results is presented in Chapter VI. The concluding chapter summarizes the research and develops thoughts on future research needs as uncovered in this study.

Limitations

This research is limited to a population of 88 banks out of a universe of over 13,000. However, the sample includes most of the largest commercial banks in the country and represents over half of the total deposits and assets in the system, with a minimum bank size of about one billion dollars in assets. The period examined, 1971 and 1972, represents the end of almost a decade of debt capital growth with the view that debt's impact, if there is any, should be evident in this period. The data examined was complete for the period and variables observed. Lengthening the time period reduced the sample size so drastically via incomplete data that it was felt a clearer analysis could be completed with a more complete sample in a shorter time frame.

The evolution of bank holding companies and their related activities since the end of the period in this research may negate some findings in this research. It is hoped, however, that the results of this study will still be useful for greater studies in the area of capital and capital adequacy within the constraints of modern multi-bank, multi-holding company environments.

CHAPTER II

THE HISTORY OF BANK DEBT CAPITAL

Prior to the depression of the 1930's senior securities such as preferred stock or debentures were not issued by commercial banks. The formation of banks and the growth of bank capital were relatively simple. The sale of common stock and, later retention of earnings, developed the capital for the expansion of the bank. The National Currency Act of February 25, 1863, first national legislation for chartering of commercial banks, authorized banks to issue common stock, subject to double liability clauses.[1] No other capital was authorized. The Act made no specific prohibition, however, and it is quite possible that debt or preferred stock could have been authorized by the administrator of banks. There are no indications, though, that any thoughts of senior issues were ever held by the banking community. No discussion can be found suggesting senior securities, even during the panic of the 1890's when substantial numbers of small banking institutions became insolvent.

After the stock market crash and during the early 30's the normal sources of bank capital, issuing of new common stock or retention of earnings were extremely limited. Earnings declined due to large charge-offs. Investors' perceptions of the future of the banking industry were clearly clouded with expectations that these institutions would or could

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[1]Until retained earnings and/or earned surplus equaled the par value of common stock the directors of a bank were liable for the "unfunded" amount in case of bankruptcy.

fail. With the continual draining of the capital base because of losses during this unsettled period, the principal administrators of the major financial agencies began to search for ideas to assist the banking industry.

President Herbert Hoover in October, 1931, issued a plea and a group of bankers came to the White House to discuss an attempt to resolve the problems of the massive bank failures of the period. Hoover's meeting resulted in the formation of the National Credit Corporation (NCC). This organization, supplied with approximately half a billion dollars of funds by the major banks in the United States, (particularly those in New York) was designed to assist weakened banks by providing liquidity for their locked-in assets. Unfortunately, the extent of the problem at the time this organization was established was so severe as to impair the ability of the NCC to make any meaningful contribution to solving the continued number of bank failures.[1]

In December of 1931 President Hoover requested from Congress the creation of a public corporation to provide public funds to banks: The Reconstruction Finance Corporation (RFC). The authorizing legislation was completed on the 22nd of January, 1932. The U.S. Treasury was authorized under the Act to loan funds to the RFC so it could make fully secured loans to banks with an initial maturity not to exceed three years.

The question, of course, was whether banks needed more loans or more capital? Jesse Jones, a director of the RFC recalls in his book, Fifty Billion Dollars, that by June of 1932 that question began to

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[1]J. F. T. O'Connor, The Banking Crisis and Recovery Under the Roosevelt Administration (Chicago: Callaghan and Company, 1938), pp. 54-58.

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appear.[1] The capital question resulted in legislation on March 9, 1933 entitled, The Emergency Banking Act, which gave the Secretary of the Treasury authority for the RFC to subscribe to preferred stock issues of a financially troubled bank, or to make loans secured by such a stock issue.[2]

Within a week the RFC had purchased its first issue and within a month it was committed to purchases of almost fifteen million dollars in preferred stock issues.[3] An interesting feature of the Emergency Banking Act was an amendment passed on March 24, 1933, that limited the RFC's purchases of preferred stock to only those banks which were allowed to issue non-assessable stocks. The government was not interested in having to advance additional funds under the double liability clauses if the bank issuing the preferred stock should go bankrupt. The March 24th amendment to the Act also allowed the RFC to purchase issues of capital notes and debentures rather than preferred stock, if the banking law of the state in which the bank operated still contained the assessable liability clauses.

Bankers, however, were hesitant to ask the RFC for any support because of the stigma attached to this aid. To go to RFC implied weakness and "only those banks in trouble" did go.[4] To overcome this

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[1]Jesse H. Jones and Edward Angly, Fifty Billion Dollars: My Thirteen Years with the R.F.C., 1932-45 (New York: The Macmillan Company, 1951), p. 33.

[2]Sections 301-304 of The Emergency Banking Act of 1933; 12 U.S.C., Sections 51a-51d.

[3]Jones, Fifty Billion Dollars, pp. 33-35.

[4]Ibid., p. 35.

reluctance the RFC asked banks with stronger capital positions to participate in supporting the RFC's position of strengthening all banks and not just those on the verge of bankruptcy. It was hoped that if strong banks issued preferred stock or other debt issues the stigma of RFC involvement would be eliminated. The results of such moral suasion by the RFC appeared to have some results and by late 1933 slightly over 68 million dollars of debt instruments were issued by 12 New York banks to the RFC.[1] Unfortunately, the literature reviewed did not give any other insights as to the other decision variables the RFC and bankers analyzed when making and requesting the authorization to issue or buy debt securities. For instance, did the banks see the debt issues as sources of cheaper capital? Clearly, the over-powering need for more capital because of the massive loan losses of the 30's eliminated any discussion by the industry as to financial risk or other factors that might be evaluated or be important as to the decision whether bank debt capital should be allowed. The discussion of risk variables inherent in the debt capital decision were left to the early 60's.

In 1933 changes developed in the banking industry. The Federal Reserve Board changed its position regarding debt capital. The Board recommended an amendment to the Federal Reserve Act that allowed the terms "capital" and "capital stock" to include any outstanding capital notes and/or debentures held by the RFC. The amendment passed on June 16, 1934. Thereafter, banks could use that definition to support their legal loan limits and any analysis the Federal Reserve Board

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[1]Ibid., pp. 35-36.

undertook relating to capital adequacy would include capital debentures.[1]

In 1934 many banks wanted to retire RFC advances, particularly strong banks which had bowed to moral suasion and has issued preferred stock or debt at the request of the RFC. It appears that the stigma attached to RFC loans still bothered bankers.[2] Entering 1935 the RFC's holdings of banks' preferred stock and capital notes reached its high point; it totaled approximately 900 million dollars; it equaled close to 20 percent of all the capital in the United States banking system. From that year on RFC's exposure diminished and its impact lessened.

In September, 1941 the last RFC authorization for the purchase of a debt issue was given; in 1945 the last authorization for a preferred stock purchase was completed.[3] In all, over 4,200 individual banks and trust companies received preferred stock authorizations from the RFC totaling almost 900 million dollars and an additional 2,900 banks issued over 400 million dollars in debt securities (including some joint issues) through the RFC.[4] Starting in September 1953, the U.S. Treasury took over the RFC's liquidation function and at that time the Corporation held only 45 million dollars of preferred stock and debentures.

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[1]Federal Reserve Act, Section 9 (paragraph 1), June 16, 1934.

[2]Jones, Fifty Billion Dollars, pp. 36-39.

[3]U.S. Treasury Department, Final Report on the Reconstruction Finance Corporation, (Washington: U.S. Governmental Printing Office, 1959).

[4]Ibid., p. 176.

By the late 1930's traditional ratios began to change due to the large growth in deposits in the banking system. World War II accelerated this change. The debt question was principally one of how fast can RFC issues be repaid. The issuing of debt for increasing the capital base was not a priority question. The industry was extremely liquid and though capital ratios were declining it was not deemed dangerous. The principal attitude on debt capital appeared to be one of distaste, a persistent perception that its use indicated weakness.

Debt in the 1950's

The 50's witnessed a large post-War increase in assets and deposit growth, yet a relatively slow growth of retained earnings. The obvious result was a decline in the standard tests of bank capital; the ratio of bank capital/deposits and bank capital/risk assets. With this advent of the decline in ratios, bank supervisory administrators again began to question the strength of banks in reference to their capital position(s). Regulatory agencies began to develop formulas to measure the strength of bank capital--the adequate capital concept.[1] The emphasis of regulations shifted from deposits to a "risk asset" basis as a means of analyzing bank risks. The resulting interpretations of the formulas encouraged regulatory authorities to push for more capital via the sale of common stock. Unfortunately the banks' ability to sell additional stock was limited and in many cases if stock could be sold

[1]See for instance: A Measure of Minimum Capital Adequacy, The Bank Examination Department of Federal Reserve Bank of New York, December 12, 1952; and, Howard D. Crosse, Management Policies for Commercial Banks (Englewood Cliffs: Prentice-Hall, Inc., 1962).

it was at the expense of existing stockholders. Banks generally did not show a large return to their existing investors; as a result common stock was selling below book value. In essence, if the bank was not a major money bank in a major city it appeared that there was effectively no market for any of the bank's new shares. The result was then pre-determined; no market implied low prices for equity issues and therefore difficulty in issuing equity securities.

Due to the complexity of reviewing all the individual states' banking laws in the early 50's only national banks will be reviewed here.[1] Observing national banks via the review of the National Bank Code, it is clear that banks required specific approval of the Comptroller of the Currency before non-equity issues could be sold. By the mid-50's the pressures for some flexibility, or at least for the need in increasing the capital base of financial institutions led to an Advisory Committee in 1956 in the U.S. Senate. The charge to this committee was to review all existing statutes and to make recommendations for change.[2] A non-voting participant of that particular committee was James Saxon who acted as Secretary to the group. Since Mr. Saxon played an important role in the future growth of debt capital

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[1]Secondary sources indicate that there was very little agreement by states on whether banks should be allowed to issue any senior security with many states appearing to believe the use of debt capital to be totally unsuited to banks. See David N. Cole, "Senior Securities in the Capital Structure of Commercial Banks," (Ph.D. dissertation, Indiana University, 1965), pp. 22-24.

[2]U.S. Congress, Senate Banking and Currency Committee, Study of Banking Laws, Report of the Advisory Committee for the Study of Federal Statutes Governing Financial Institutions and Credit (Washington: U.S. Government Printing Office, 1956).

and in what we now call modern commercial banking, it is interesting to note that he was an observer on this particular Advisory Committee review.

Concerning debt capital, the committee's report stated:

> . . . banks should have access to additional capital without total reliance on common capital. In some circumstances, preferred stock or debenture issues would offer a better and more feasible means of acquiring additional capital. Expansion of capital by this means is also advantageous for the reason that capital represented by such securities can be contracted by redemption or payment at any time that the additional capital represented by such securities is not needed in the business. The use of such securities, therefore, provide some flexible means of adjusting the capital requirements of banks to the needs of the times.[1]

Nowhere in the report does the question of financial risk (if any) to banks by the issuance of debt capital appear (or any other disadvantages or advantages that might accrue to a bank).

Heads of various organizations who appeared before the Senate Banking and Currency Committee gave various reasons for the committee to consider the specific authorization of bank debt capital. Their support generally settled around the need for flexibility in financing because it may be ". . . preferable to obtain capital by other means than by increasing stock."[2] It should be pointed out that the representative from the U.S. Chamber of Commerce, Mr. Turner, had no objection to preferred stock sales, but opposed any authority to issue debt capital. And he specified that the issuance of debt capital

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[1]Ibid., p. 14.

[2]U.S. Congress, Senate Banking and Currency Committee, Study on Banking Laws, Financial Institutions Act of 1957, Hearings, 84th Congress, 2nd Session, 1956, p. 525.

carried ". . . dangerous implications" and that approval be granted only in extreme emergency situations for any such debt securities.[1] The Chairman of the Finance Committee of the United States Chamber of Commerce, Mr. William A. McDonnell, showed opposition to any issue that was not "pure equity":

> The moment bank stock becomes convertible preferred or convertible debenture it tends to confuse prospective stockholders. For this reason it has proved better . . . to have one class of stock; we have not, however, opposed the issuance of straight preferred stock by banks.[2]

Why would an individual of such stature as Mr. McDonnell make such a "plain" and rather "weak" statement? The only plausible answer is that he was implying that stockholders could not adequately analyze banks with debt capital because of unforeseen risk generated by debt. He was apparently worried about the risk associated with leverage. The Comptroller of the Currency, Ray Gidney, testified that preferred stock should only be used in unusual or urgent situations. He also specifically opposed the sale of capital notes except in extreme emergency circumstances:

> Sale of such notes or debentures . . . would cause the common capital stock of some and perhaps many national banks to lose its attractiveness as an investment because of the adverse leverage of risk brought about by enlarged asset structure based on funds realized by the sale of notes or debentures.[3]

To further bring out the risk view of debt opponents one can look to the representative from the Federal Reserve Board, Governor Robertson. He opposed the issuance of capital debentures (and quite

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[1]Ibid., p. 663.

[2]Ibid., pp. 664-5.

[3]Ibid., p. 788.

simply any other non-common stock form of equity) and replied to a specific question as follows:

> . . . over many, many years the capital structure of national banks has been kept very simple. It can be understood by anybody. It does not require an expert to analyze the capital structure of a bank.[1]

His concern is slightly broader than McDonnel's and appears to be concerned with depositors rather than (just) stockholders. There is a clear assumption in his comment that people are concerned with the capital structures of banks and that they review them. As will be discussed later in detail, studies on that assumption do not support his view. At best only some of the large corporations do look at bank capital structures, and then, it appears, because they are concerned with lending limits they can receive from the bank.

A final point of view to be summarized is that of Chairman Cook of the Federal Deposit Insurance Corporation who was opposed to any issuance of securities except common stock because he believed they constituted only temporary capital.[2] In a strict interpretation, Chairman Cook is correct. Debt instruments do have a maturity date, but it is frequently 20 or more years away. With that amount of time it appears doubtful that the bank will be caught in a squeeze when debt becomes due. What is of importance is the fact that debt capital can generate additional earnings which, if retained, will build the capital base even faster. He gives no credit to the potential value of increased earnings through leverage and, more critically, the alternative result of not adding to the capital base with debt; i.e., the

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[1]Ibid., pp. 860-1.

[2]Ibid., p. 866.

forcing of the bank to curtail its lending activities.

As it turned out, all the hearings did little but point out the need for more capital, but suggested no way to obtain it. In addition, there appeared to be an extremely naive approach to the problem by many key administrators in the banking system. There was no rigor of thought demonstrated by the Federal agencies in their views and the rather weak view of "complexity" summarizes the negative attitudes. No provisions in the bill ever became law. Despite many days of hearings the bill was simply buried. It never did come before the House for vote even though some parts of it had been supported by the Senate.

The 1962 Authorization of the Comptroller

In 1961 the Commission on Money and Credit recommended in its Report that private financial institutions be allowed and encouraged to increase capital. They went so far as to suggest that officials should explore the authorization of debt capital as well as preferred stock as a means to encourage the increase in capital.[1] In 1962, the Advisory Committee on Banking to the Comptroller of the Currency in its Report, National Banks and the Future, suggested that national banks be allowed to utilize all techniques in raising capital that are available to any corporation and not be confined to just common stock. Specifically, in its summary of senior securities, the Committee stated:

> Use of preferred stock and debentures should no longer be regarded solely as emergency measures, but should be recognized

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[1]Commission on Money and Credit: Their Influences on Jobs, Prices, and Growth (Englewood Cliffs: Prentice-Hall, Inc., 1961), p. 174.

> as normal methods for obtaining capital funds. This attitude of the Comptroller of the Currency on this subject should be liberalized. Flexibility should be afforded by permitting the use of appropriate cases of various features such as convertibility or subordination.[1]

The new Comptroller of the Currency, who replaced Ray Gidney, was James J. Saxon, the former Secretary of the Senate Banking Study in the 50's. He promptly reversed the Gidney policy. The Comptroller ruled on December 20, 1962, on a change in the Corporate Practices and Procedures of National Banking Associations giving a new interpretation for senior securities. Specifically, he authorized the following changes:

> Capital debentures (a) it is the policy of the Comptroller of the Currency to permit the issuance of convertible or non-convertible capital debentures by national banking associations in accordance with normal business considerations, (b) subject to the provisions of 12 U.S.C., Section 82, the bank may, with the approval of stockholders owning two-thirds of the stock of the bank, entitled to vote, issue convertible or non-convertible capital debentures in such amounts and under such terms and conditions as shall be approved by the Comptroller, provided, however, that the principal amount of capital debentures outstanding at any time, when added to all other outstanding indebtedness of the bank, except those forms of indebtedness exempt from the provisions of 12 U.S.C., Section 82, shall not exceed in an amount equal to 100% of the bank's unimpaired paid-in capital stock plus 50% of the amount of its unimpaired surplus fund.[2]

In addition, within a year, Comptroller Saxon issued another interpretation of the U.S. Code (Title 12 Section 84) allowing national banks to include capital notes and debentures in "aggregate unimpaired

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[1]Comptroller of the Currency, National Banks and the Future, Report of the Advisory Committee on Banking to the Comptroller of the Currency (Washington: Government Printing Office, 1962), p. 83.

[2]James J. Saxon, "National Banks: Capital Notes and Debentures, Relation to Lending Limits." Letter to the presidents of all national banks, December 17, 1963, as quoted in Cole, "Senior Securities," p. 37.

capital."[1] That ruling enabled national banks to include debt capital in their ratios for calculating legal loan limits. It also continued the pressure on state bank regulators to change their attitudes on debt and (under pressure from Saxon's continual liberal rulings) to change many laws.

Regulatory Positions on Debt Capital

The banking industry has four principal sources of regulatory control which affect most of its decisions. On the Federal level there is the Federal Reserve Board (FED); the Office of the Comptroller of the Currency, and the Federal Deposit Insurance Corporation (FDIC). At the state level there is in each state a regulator specifically charged to oversee banks. Although the potential for an extremely complex set of laws is possible, in the main the regulations tend to be compatible.

For this research the laws and regulations on debt capital are important. The Comptroller's view is the most liberal and allows banks to issue debt, whether straight or convertible, subject only to the limitations of 100 percent of paid-in and unimpaired stock plus 50 percent of unimpaired surplus.[2]

The Federal Reserve Board's view has been more narrow and restrictive (and continues so as of the writing of this paper). Capital notes are accepted as capital in tests of capital adequacy and banks are allowed to issue debt subject to the 100-50% limitations.

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[1]Ibid.

[2]Title 12, Code of Federal Regulation, Section 14.56.

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But the funds raised by debt issues are:

> . . . excluded as bank capital for purposes of (1) loans to affiliates, (2) purchases of investment securities, (3) investment in bank premises, (4) loans on stock collateral, (5) deposits with non-member banks, (6) bank acceptances, and (7) lending limit restrictions.[1]

The Fed's restrictions actually carry little impact on the management of bank lending and on operating policies, most of them not being subject to the restrictions.

The FDIC's authority over debt capital is even more limited. It does have authority over the approval of any repayment of debt issues because the payments are considered a reduction in capital. The implication here, of course, is that if a bank was deemed to have a shortage of capital no prepayment of debt would be allowed. The FDIC can do nothing about the normal reduction of debt capital via sinking fund requirements or debt maturity. In cases where an issue was coming due and the FDIC felt a bank had a weak capital position it is implied that pressure would be put on the bank to "add to capital."

The laws of individual states, although more complex, still generally follow the lead of Federal authorities (particularly the Comptroller). The 1962 ruling by Saxon acted as a prod and by 1966 the states' attitudes on debt capital appear more favorable (for details of every state see Appendix B). Of the major states, for instance, only California appears restrictive in the sense they do not

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[1]Letter dated May 13, 1974 from H. G. Pannell, Regional Counsel, Regional Administrator of National Banks, Comptroller of the Currency. It should also be pointed out that the view the Fed follows has been in effect since 1964 without change (See paragraph 2308 of the Interpretations of the Board of Governors, Federal Reserve Board, Washington, D.C.).

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allow debt to be counted for establishing a lending limit.

Conclusion

There appears to be a definite (but not universally shared) shift in the views of supervisory agencies toward the permission of debt as a "non-distress" form of raising capital. It can also be observed that the largest and most influential banks in the country are issuing debt capital. As can be seen by Table 1 there have been over 400 issues of debt in the nine year period ending December 1972. It would appear that Herb Bratter's view in 1964 that banks would agree with the Comptroller and issue debt in the course of ". . . normal business considerations," has been carried out.[1] The continuation of debt expansion appears to be a fact. Given present laws it appears that as of year end 1972 the system had the legal capacity to issue about $23.65 billion of debt capital--and it had outstanding only $4.1 billion.[2]

In slightly more than a decade the role of debt capital (and the entire capital structure) in the banking system has clearly changed. Debt has traveled the route from distress financing to an accepted position in many large commercial banks. The movement is not unexpected, given the rapid growth in the industry and economy. The following chapters will develop the full extent of the use of debt capital and work toward answering the question as to the financial impact debt actually has on a bank.

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[1]Herbert Bratter, "Debentures: A New Way to Raise Banking Capital," Banking, vol. 56 (February, 1964), p. 59.

[2]Taking 100% of common stock ($12.9 billion) and 50% of surplus ($21.5 billion) generates $23.65 billion. See FDIC, Annual Report, 1972 edition (Washington, D.C., 1973), p. 251.

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TABLE 1

CAPITAL NOTES OR DEBENTURES ISSUED BY
COMMERCIAL BANKS 1964-72*

	Public Issues		Private Issues		Total	
	Amount Issued**	(Number)	Amount Issued**	(Number)	Amount Issued**	(Number)
1964	$ 313,862	(10)	$ 293,850	(71)	$ 607,712	(81)
1965	647,908	(10)	176,173	(57)	824,081	(67)
1966	78,250	(4)	84,100	(19)	162,350	(23)
1967	248,010	(9)	7,385	(6)	255,395	(15)
1968	317,549	(8)	24,994	(13)	340,543	(21)
1969	221,851	(14)	39,800	(7)	261,651	(21)
1970	116,234	(17)	9,900	(3)	126,134	(20)
1971	1,535,500	(56)	36,500	(8)	1,572,000	(64)
1972	2,109,850	(57)	305,180	(32)	2,414,030	(89)
Total	$5,589,014	(185)	$ 974,882	(216)	$6,563,896	(401)

SOURCE: Irving Trust Company, Corporate Financial Counseling Department.

*These numbers do not total precisely to F.D.I.C. figures due to some small banks not publicly reporting debt issues, but the differences appear to be negligible.

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CHAPTER III

PROS AND CONS OF DEBT CAPITAL

Introduction

Debt capital policies of commercial banks have generated heated debate--most of which, unfortunately, has been debated on emotional and political levels. The intention of this research is to examine the debt question by reviewing various financial characteristics of banks containing debt capital relative to banks utilizing only equity financing. This more objective analysis should then allow other questions on bank capital to be examined uncluttered by the debt decision.

In examining the pro and con arguments of bank debt issues it is clear that each side argues basically from one of two positions. Those opposed stress social views: depositor safety and industry stability. Those favoring debt look to stockholders' wealth and managements' right to exercise choice in capital selection.[1] To give serious consideration to both views the key elements of both should be subjected to examination. If analysis shows that debt capital in an institution is positively responsive to the growing financial needs of the community, a positive view of debt can be persuasive. Of course, analysis may show that debt tends to be risky, in which case the opponents of debt may

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[1]See George J. Vojta, Bank Capital Adequacy (New York: First City Bank, 1973) for a more complete discussion.

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have an issue outweighing its positive aspects. In either case, though, both sides will have been examined and conclusions can be drawn more plausibly. The following sections summarize the various views held on bank debt capital.

Overview of Debt Capital Views

Although these points are developed previously, a brief overview of the arguments concerning debt capital is presented below.

In favor:

1. Leverage. "Trading on the equity" or "financial leverage" are the terms used when debt is injected into a firm. The essence of leverage[1] is simply the act of utilizing debt that carries with it a fixed claim on the income stream (interest payments) as a source of funds and reemploying it in higher yielding assets. The difference (in favorable or positive leverage), on the margin, accrues to the stockholders.[2] This technique has been used extensively in other industries and proponents believe banks should do the same. Risk, thought of as increased variability or volatility in earnings, is by

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[1]As had been noted previously one should note the difference between "financial leverage" (the injection of debt) and "capital," "structural," or "secondary" leverage (the effect or nature of the legal requirements for capital). This section discusses financial leverage and later a detailed discussion of capital leverage will be presented.

[2]For detailed discussion of leverage in general, see, for example, A. E. Grunewald and E. E. Nemmers, Basic Managerial Finance (New York: Holt, Rinehart and Winston, Inc., 1970), pp. 67-78; and for banking in particular, see Herbert Bratter, "Debentures: A New Way to Raise Banking Capital," Banking, vol. 56 (February, 1964), p. 584.

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definition greater; but advocates of debt stress that the expected increase in returns is more than sufficient to offset the chance of a decrease in earnings.

2. Flexibility. The ability of banks to issue debt capital offers management alternatives to the total equity financing of the firm. Considerations like cost of flotation; permanent versus temporary need; dilution; general capital market conditions; and others, can be analyzed. The resulting decision, it is assumed, will blend all constraints and therefore, lead to the best decision.[1]

3. Multiplier Effect. In any increase of bank capital the structure of the industry creates a multiplier effect.[2] Using debt capital is not by itself the cause for the multiplier, but the effect is still an advantage to the bank when debt is issued. Specifically, the legal structure of the industry allows deposits and assets to be built upon a "fractional" capital base. The amount of the multiplier is broadly based on limits imposed under capital adequacy guidelines

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[1]See for instance, Paul S. Nadler, "Can Debentures Serve the Smaller Banks?" Banking, vol. 57 (November, 1964), pp. 43+; Paul S. Nadler, Commercial Banking in the Economy (New York: Random House, 1968); Paul S. Nadler, "Some Better Ways to Raise Bank Capital," Banking, vol. 61 (March, 1969), pp. 49+; and Eugene Brigham and Michael Kawaja, "Convertible Debentures," The Bankers Magazine, vol. 150 (Autumn, 1967), pp. 26-33.

[2]Cohen calls it "secondary effects"; Cates calls it "capital leverage"' and Wade calls it "structural leverage." See, David C. Cates, "The Savings Debentures: New Form of Bank Finance," Bankers Monthly, vol. 87 (February, 1970), p. 30; David C. Cates, "Bank Debentures, Leverage and Debt Capacity," Bankers Monthly, vol. 80 (November, 1963), p. 22; Julien J. Wade, "Senior Capital: Its Impact on the Value of Bank Common Shares" (Ph.D. dissertation, Stanford University, 1972), p. 1; and Kalman J. Cohen, "Dynamic Balance Sheet Management: A Management Science Approach," Journal of Bank Research, vol. 3, no. 4 (Winter, 1972), p. 17.

or standards developed by regulatory agencies. As a rough rule of thumb one can estimate approximately 10 dollars of deposits and asset growth can be supported for every 1 dollar of capital.[1] Therefore, up to the limits on amount of debt legally allowed to be issued,[2] any increase in capital carries with it very large asset growth potential, and correspondingly large earnings increases.

4. Costs. Cost considerations of debt capital center on three areas: (a) the after tax cost of capital, (b) the cost of flotation or issuing, and (c) the cost as a source of funds. The first two costs are, by advocates, assumed lower for debt.[3] The last cost is dependent on market conditions, but frequently can be lower than any other source of funds.[4] This condition comes about due to the fact debentures do not require reserve requirements as do deposits; FDIC insurance is not charged to them; liquidity requirements as they relate to maintaining secondary reserves are eliminated; and their

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[1]Cohen, "Dynamic Balance Sheet," p. 17.

[2]As previously noted the law restricts debt to a maximum of 100% of paid-in-capital plus 50% of surplus funds.

[3]This assumption is not of much concern as it relates to "flotation costs" but is heatedly debated as it relates to the cost of capital. The cost of equity (new) is that rate of return which must be earned to "maintain the market value of the enterprise" (Grunewald and Nemmers, Basic Managerial Finance, p. 336). This rate is the " . . . relevant cost even though it is not a cash outlay." (Cates, "The Savings Debenture," p. 27). When one reviews the after-tax cost of equity versus debt issues (due to interest deductions on debt), debt has a lower cost. The crux of the issue, though, is whether the market will adjust its expected rate of return (higher) due to the risk of the debt. If that adjustment is held steady or assumed away, debt is almost always cheaper. That question was studied (Wade, "Senior Capital: . . .") in banks and the "rate of return" was not increased by the addition of debt.

[4]R. I. Robinson and R. Pettway, Policies for Optimum Bank Capital, p. 17 and p. 35.

cost of administration is low.

5. Depositor Protection. In the specific design of debt capital, the subordination clause is paramount. It expressly reduces the bondholders claims below almost all other claims, especially depositors. This feature creates an additional buffer in times of economic crisis for depositors, with the risk of bond default borne by the stockholders.

6. Dividend Effects. The leverage nature of debt creates an expected increase in the earnings stream after taxes. One potential benefit of this increased income stream could be the decision to increase the dividends paid and hence increase the attractiveness of the common stock.[1] The result would be two-fold: stockholders would be rewarded with a higher stock price, and future sales of equity issues, if needed, could be obtained at favorable conditions from a supportive market. In addition, if it is assumed that the increased earnings are sufficient to meet higher dividends and generate higher retained earnings, the capital base of the bank would continue to grow and be protected.

Arguments against debt:

1. Leverage. One simply cannot eliminate the fact that if earnings do not increase, fixed charges associated with debt will drive down the earnings available to stockholders and reduce protection to depositors (income being the first line of defense for

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[1]This view was clearly expressed in Commission on Money and Credit. The Commercial Banking Industry (Englewood Cliffs: Prentice-Hall, Inc., 1962), pp. 325-8.

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depositors). Leverage can work both ways.[1] Eventually, if earnings drop (usually due to heavy losses on loans, etc.) the fixed charges may actually result in insolvency.[2] In addition, banks are "structurally" levered and they do not need more leverage.[3]

2. Cushion of Safety. The potential cushion of debt capital should not be casually used. It should be saved and used as a source of "last resort." If banks used all their debt capacity now, they would have none available in periods of need.[4]

3. Image. People place a trust in banks. The use of debt would decrease this trust; "confuse" the analysis of bank stocks; and "complicate" their capital structure.[5] Even in periods of economic strength the results would be to weaken bank stock prices and hence, shareholders wealth.

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[1]Bratter, "Debentures: A New Way . . .," p. 100.

[2]It must be explicitly pointed out that one subjective argument will never be satisfactorily settled: the chance of a severe economic upheaval. It is an expressed assumption in this research that the magnitude of the Great Depression will not be seen in our economy. If an economic turn down like the 30's did appear, the existing system utilizing the Federal Reserve and the psychic value of deposit insurance would act as a floor to support the banking industry. If one does not support the above view, then greater credibility is assigned to the absence of debt in the capital structure.

[3]Eugene W. Lambert, "Bank Debt Debentures: The Investor's Viewpoint," Financial Analyst Journal, vol. 22 (May-June, 1966), p. 98.

[4]It should be pointed out, though that in any debt situation one usually tries to borrow from strength. Private investors would tend not to invest if the bank or the industry were having problems though it may be that a government agency (like RFC) would loan funds.

[5]For a total review of this argument, see U.S. Congress, Senate Banking and Currency Committee, Hearings, 84th Congress, 2nd Session, 1956, particularly pp. 524-528; 660-666; 780-790.

4. Public Responsibility. It has been the view that long term debt is shown "below the line" as a source of semi-permanent funds for the semi-permanent needs of a firm. The utilization of debt by banks does not change that basic issue--except for the fact that banks are not totally like other types of business. It is this difference (broadly thought of here as public trust and responsibility) that requires them to be heavily regulated. The interwoven relationship of banking's role in the economy as intermediaries and as a tool of Federal Reserve policy simply places them outside the mainstream of non-bank corporations.[1] When a bank fails many more lose besides the stockholders. Public trust is shaken. Depositors with sums in amounts greater than those covered by deposit insurance stand to lose unless a forced marriage with a healthy bank is consummated. It is implied, therefore, that banks are different from other companies and therefore decisions on the risks of debt must be conservative.

Summary

To examine the different views on the use of debt capital an examination of the results of the decade of debt is required. Over 400 banks, including a large number of the largest 150 banks, have issued debt capital in amounts exceeding six billion dollars during the decade ending in 1972.[2] Examination of selected banks will be the

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[1]See David C. Cates, "Is This a Good Time to Issue Capital Notes?" Bankers Monthly Magazine, vol. 83 (March, 1966), p. 31; and Martin Kern, "A Critical Look at Capital Notes," Banking, vol. 58 (November, 1965), p. 50.

[2]Irving Trust Company, Bank Securities Report (New York: Corporate Financial Counseling Department) Bi-monthly through December, 1972.

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basis for resolving the conflict in views previously presented while the next chapter will examine the conflicting views as disclosed in completed empirical studies. From that point, the research design will be developed, data explained and analysis made in light of the conflicts shown in the literature.

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CHAPTER IV

PRIOR RESEARCH WITH RESPECT TO BANK CAPITAL

Introduction

The banking industry's influence on the daily activities of our country is so great that the literature on banking is vast and varied. Due to this size of material available on banking only the following limited topic areas are used to present a review of the literature for this research: (1) cost of capital and stock prices and, (2) the function, role, and needs of capital. For purposes of logical development the legal constraints applicable to the above areas are also presented even though Chapter II developed a detailed overview of the legal implications of debt capital. In addition, the few specific studies on debt capital are reviewed individually.

Cost of Capital and Stock Prices

No investigation of bank capital would be complete without geginning with the basic analysis of David Durand's study, Bank Stock Prices and Bank Capital.[1] Durand's study does not deal directly with bank debt for the obvious reason that it was conducted before senior debt capital was a viable alternative in bank structures. The value of the work,

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[1]David Durand, Bank Stock Prices and the Bank Capital Problem, National Bureau of Economic Research Occasional Paper No. 54, 1957, (Ann Arbor: University Microfilms, Inc., 1966).

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however, is its rigor in pioneering in the area of bank stock price analysis in a period of rapid bank growth. Durand's research objective was to find or determine the cost of bank equity capital. He believed that if the cost of bank equity capital could be approximated it would equate the rate of return required to attract new equity into the industry which was experiencing a rapid growth in deposits. He broadly defined the rate of return on bank equity as that rate required to keep bank stock prices at book value. His study covered an 8-year period from 1946 to 1953 and consisted of 117 large banks.

He divided the study into six large geographical areas and developed a design that resulted in 48 separate cross-sectional groupings which were then analyzed by a multiple regression technique. His market price was expressed as an exponential function of book value, dividends, and earnings per share: $P = kB^bD^dE^e$. Durand tested many variables and rejected all but the above three, which were the only ones to show any significant influence on market price. He also tested the growth and stability of earnings per share, the risk asset-capital ratio, the total assets to total capital ratios, and the absolute size of bank capital. All were rejected as having no significance on stock price.

The results of Durand's study indicated that dividends were clearly the most important influence on market price with book value being the next most important. He further tested dividend effects by examining the ratio of market price to book value as a function of earnings to book value and dividends to book value. Dividends were significant. Stocks paying a higher proportion of earnings out as dividends tended to sell at a higher price to book value ratio than those of banks with smaller payout ratios.

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Eugene Drzycimski in an unpublished dissertation tried to find the important variables affecting both bank stock prices and the price to earnings ratios.[1] His study covered a sample of 113 large commercial banks and 9 holding companies spread out over the country for a period from 1955 to 1964. In addition, in one part of his study, Drzycimski deliberately replicated and extended Durand's earlier work with updated data from 1960 to 1964. In the replication of Durand's study, Drzycimski concluded that geographic location, book value, and dividends had declined significantly in their influence and in some instances were not an important influence. He also felt the relative influence of earnings per share had increased.

In explaining the variation of price to earnings ratios he found very few significant results. Drzycimski's principal statistical approach was multiple regression and using that method he found very little explained variation in any of his variables. The most successful one he found was that a high payout of dividends (a payout of greater than 55% of earnings in dividends) did indicate some explanation of variance.

While Drzycimski's study gave generally inconclusive statistical significance concerning crucial variables affecting stock prices and price earnings ratios, his study did lead him to make several conclusions that are of interest for this research. Two of these were: (1) grouping banks by their amount of dividend payout produced the most consistent results and (2) high payout banks, in general, had the highest P/E ratio,

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[1]Eugene F. Drzycimski, "A Study of the Determinants of Common Stock Prices and Price Relatives for a Selected Sample of Large Commercial Banks" (Ph.D. dissertation, Department of Accounting and Financial Administration, Michigan State University, 1966).

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Drzycimski's comment on the banks with high P/E having the most debt, although of interest in this research, is of modest value. The reason is simply the timing and size of his study--only in one year (1964) was there debt in any banks in his sample and the banks using debt were small. But questions he attempted to answer were crucial. For instance, if it is true that banks with debt have higher payout ratios then it is possible that bank management is utilizing debt capital for increased leverage while aiming for an optimal capital structure. For example, assume two banks identical in size and in before-tax earnings, except that one has debt capital and one does not. Assuming favorable leverage the debt bank would have higher per share earnings. If the debt bank's management tends to pay this extra earnings out and, in fact, creates higher payouts, as Drzycimski states, then bank management is principally stockholder oriented. If Durand's research is correct their policy will directly increase the wealth position of the stockholders. The dividends will be higher and, since the payout is greater, the P/E ratio will be greater. On the other hand, if debt banks keep their payout ratio level with other banks the implication is that the favorable leverage is shared by stockholders and depositors. The increased (levered) earnings stream will be used not only in increased payout but also to add retained earnings (equity) to the bank for future growth.

The dividend payout and earnings question is, as shown, important. The question of whether earnings increase and the actual use or disposition of the (assumed) increase in earnings carries with it major policy implications and should be clearly examined. This study will examine

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debt's effect on dividend payout and its corresponding retained earnings growth.

In 1966, James Van Horne and Raymond Helwig examined a sample of 118 small state banks in Michigan with deposits of less than $10 million.[1] Their objective was to determine the functions that influenced the ratio of the market price of the stock of these small banks to various price relatives. They paired selected variables and examined them on a cross-sectional basis with statistical significance based on the calculation of product-moment correlation coefficients. Although they did not examine the effect of debt financing for many of the same reasons that Drzycimski did not (i.e., the timing of the study and the size of the banks did not lend to such analysis) they did find very strong positive associations between dividend payout and the price to earnings ratio. A strong inference from this study is that a large dividend payout ratio raised market prices and that those banks that were involved in some type of equity capital financing (versus internal financing) tended to have a higher payout ratio than those banks that were not resorting to external equity capital financing. Their study suggests that small bank investors' (stockholders) returns were probably limited in appreciation potential and the dividend yield was the only return potential. That view ties in with the accepted opinion that the limited market for shares of small bank stocks leads its investment value to tie closely with dividend yield (and therefore payout). The result, as they analyzed it, indicated that high

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[1]James Van Horne and Raymond Helwig, The Valuation of Small Bank Stock, Occasional Paper (East Lansing: Bureau of Business and Economic Research, Graduate School of Business, Michigan State University, 1966).

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payout raised stock prices and those banks needing equity funds (as seen by post equity offerings) kept their payouts high.

Although their study concerned only small banks and was prior to the debt issuing period its observations on capital additions are of interest to this study. This research reviews banks that added extensively to their capital base, as theirs did, and compares those banks with banks doing no outside capital funding.

Other associations between variables in the Van Horne and Helwig study tended to be inconclusive. In reviewing the associations between P/E ratios and capital/debt ratio; loan/deposit ratio; and the growth rate of deposit, no significance was discovered. This study will also examine some of those variables from the view of large banks and if the debt/non-debt decision results in significant differences.

In 1965 George C. Hawke wrote an essay for the Institute of Investment Banking in which he looked at the effect of bank debt capital on the capitalization rate expected by shareholders.[1] The basis for the study was the assumption that investors' and depositors' attitudes were important indicators of a bank's image. By observing the trend in a bank's P/E multiple and its deposit growth he postulated that you could measure those attitudes. He looked at 12 banks one year before and one year after they issued debt capital. Net operating

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[1]George C. Hawke, Capital Note Financing of Commercial Banks (Philadelphia: Investment Bankers Association and Wharton School of Finance and Commerce, 1965).

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[1]Ibid

[2]Rola
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earnings per share for the banks for the prior year (calculated by the month) were compared with a Value Line Investment Survey of selected bank averages covering a thirteen-year median of P/E ratios. The result drawn by Hawke were: ". . . it appeared that in most cases investors in bank stock and bank depositors do not regard the sale of senior debt securities by banks unfavorably."[1]

Hawke's results must be accepted with care, given the small sample, the lack of statistical tests and the limitation placed on the study by only using two variables. In addition, as Robinson and Pettway point out in their study on optimum capital, even if debt capital produces a lower cost of capital in the short run, it may increase in the long run.[2] Their reasoning is based on the traditional assumptions that investors will expect a higher price for greater risk they bear.

Hawke's study of investors' and depositors' attitudes is important notwithstanding the weakness of the research design. Hawke tried to use external (market) variables that would show by overt investor actions what their perceptions are. The approach appears sound.

William Staats, in 1966 while a research economist for the Federal Reserve of Philadelphia also developed a study of "investor's perception."[3] He surveyed corporate treasurers as to views about bank

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[1]Ibid., p. 31.

[2]Roland I. Robinson and Richard H. Pettway, Policies for Optimum Bank Capital (Chicago: Association of Reserve City Bankers, 1967), p. 35.

[3]William F. Staats, "Corporate Treasurers View Bank Capital," Banking, vol. LVIII, no. 12 (June, 1966), pp. 46-48.

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capital adequacy and their attitudes about bank capital. He randomly sampled 150 treasurers from Fortune's list of the top 500 industrial corporations (28% response rate). One-third of the replies said they never worried about the question of capital adequacy--they dealt only with the largest banks, and it appears they equated "big" with "safe." It should be noted that those "don't care" companies did have one question about the size of the capital base (as did many of the others): The legal lending limits, which are a function of capital, were important to them.

Both of the views, "care" or "don't care" although not directly related to debt capital, do lend support to the premise that one factor in the capital adequacy question is bank managements' view that they cannot restrict their growth or they will lose valuable customers by not being able to service their market. In that regard banks clearly see the need for capital to grow. If growth exceeds expectations or is so large that internal sources cannot keep up with it, then external sources must be used. Staats' survey then shows that to continue to service customers and grow a bank would logically have to expand its capital base.

Function, Role and Need of Capital

William Staats describes the function of capital as a provision of funds to:

1. Purchase physical facilities for operations
2. Provide a financial and legal base for lending and investing activities
3. Protect the depositors from losses resulting from bank insolvency

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4. Protect stockholders from loss because of impairment of capital, and
5. Help earn a return for stockholders[1]

Although Staats covers the broad functions of capital, two studies for the Association of Reserve City Bankers by Robinson and Pettway[2] and Morrison and Selden[3] (hereafter called RP and MS respectively) are more definitive. MS feel "in our judgment the real functions of bank capital in today's economy are (a) to provide operating funds and (b) to facilitate stockholders pressure towards managerial efficiency."[4] RP agreed in part with MS, but prefers to emphasize that, ". . . the primary function of bank capital, beyond that of providing physical plant, is to absorb short and intermediate term losses due to events that managerial foresight cannot be reasonably expected to anticipate."[5]

RP's view could be called a moderate regulatory view in the sense of assuming protection to the public as its primary goal (a strict regulatory view would emphasize the role of capital as the defense line against depositors' loss). MS's view, though, is more that of many bankers, that is, a managerial view. For instance,

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[1]William F. Staats, "Capital Adequacy of Commercial Banks" (Ph.D. dissertation, University of Texas, 1965), p. ii.

[2]R. I. Robinson and R. H. Pettway, Policies for Optimum Bank Capital (Chicago: Association of Reserve City Bankers, 1967).

[3]G. R. Morrison and R. T. Selden, Time Deposit Growth and the Employment of Bank Funds (Chicago: The Association of Reserve City Bankers, 1965).

[4]Ibid., p. 66.

[5]Robinson and Pettway, Optimum Capital, p. 18.

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Citibank's George Vojta stresses the theme that banking is a major industry and banks need flexibility to be allowed to compete with other industries.[1] He continually stresses the need for banks to compete with successful manufacturing companies for the capital needs of tomorrow.[2] A strong point is made by Vojta's analysis of rates of return on net worth between member banks and leading manufacturers since 1925. Banks have lagged almost every year. Only since 1970 have banks been competitive-- and then because returns dropped by approximately 20 percent for manufacturing companies.[3]

The difference in Vojta's "managerial view" and the "regulatory view" is critical because past action indicates that they are not necessarily mutually exclusive. To be competitive the bankers see the need to compete in the market place--for funds, personnel, and investment opportunities. To be competitive for capital a bank must offer returns to investors that are attractive (i.e., yield returns equal to or better than offered by other like investments of the same risk class). To be flexible demands choices being available to banks in raising capital. However, prior research has indicated that statutory requirements leave little choice and tend to demand far too large an equity base (hence a lower return on investment) on the

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[1]G. J. Vojta, Bank Capital Adequacy (New York: First National City Bank, 1973).

[2]Ibid., p. 7.

[3]Ibid.

grounds of depositors' safety.[1]

The regulatory view tends to stress safety via an emphasis on strong equity positions. The managerial view is one of optimal capital and implies "sufficient" capital to meet all "profitable" loan demands--neither too much nor too little. To come close to achieving that goal a bank must be both willing and able to be flexible in using all the possible combinations of asset and liability mix to maximize the profitability of the bank.

Kalman Cohen, a major contributor to bank research for over a decade, blends both views when he discusses the "risk backing power" of capital instruments.[2] He speaks toward management and its function to provide for risk, in its decision making. Implicit in his references is the blended view of both management and supervisory agencies and their capital adequacy formulations. In this particular article, Professor Cohen matches his comments with the experience of Bankers Trust Co. of New York. The portion of the article particularly suited to this research discusses Bankers Trust and its 100 million dollar debt capital issue.[3]

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[1]See for instance, Richard V. Cotter, "Capital Ratios and Capital Adequacy," The National Banking Review, vol. 3, no. 3 (March, 1966), pp. 333-46; Donald Jacobs, "The Framework of Commercial Bank Regulations: An Appraisal," The National Banking Review, vol. 1, no. 3 (March, 1964), pp. 350-59; and Lucille S. Mayne, "Supervision Influence on Bank Capital," Journal of Finance, no. XXVIII, no. 3 (June, 1972), pp. 637-51.

[2]Kalman J. Cohen, "Dynamic Balance Sheet Management: A Management Science Approach," Journal of Bank Research, vol. 2, no. 4 (Winter, 1972), p. 17.

[3]Ibid., pp. 17-18.

The Bankers Trust experience clearly shows bank management balancing the need for capital expansion with the necessary risks inherent in investing the debt proceeds in earnings assets. Bankers Trust follows Robinson and Pettway's view that there is inherent in bank operations "unforeseen" risk and, therefore, capital is the item used to "hedge" or provide for unplanned situations. The infusion of the 100 million dollar capital addition enables the bank to meet loan demands and, through what Cohen called the "secondary effect,"[1] to substantially add to earnings and asset growth.

The addition of any type of capital would have accomplished the above purpose but it was implied by Cohen that debt was the "cheapest." The crux of "cheaper" depends on two factors: (1) the after tax cost of debt in dollars versus additional income generated, and (2) the effect of risk taken on by the firm as perceived by both the market and management. Risk, viewed externally, is difficult to analyze. One part of the market, depositors, as viewed by Staats and previously discussed, appears to not perceive any significant change in risk and therefore do not reduce deposits. To examine investors views we will have to analyze changes or differences in market prices.

John Pringle, adding another dimension to the purpose of capital, says:

> . . . the economic role of bank capital is the following: to (1) bear risk and (2) adjust the maturity structure of liabilities in such a manner as to optimize the mix of discretionary sources of funds, and, jointly with loan policy, thereby to balance the effects of imperfections in financial markets over time in a manner that maximizes shareholders wealth.[2]

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[1]Ibid.

[2]John J. Pringle, "The Role of Capital in the Financial Management of Commercial Banks" (Ph.D. dissertation, Stanford University, 1972), p. 199.

Comparing Pringle's study and the views of Robinson and Pettway, Morrison and Selden, and Cohen, Pringle can be thought of as expanding MS's and Cohen's belief in the regard of bank capital acting as stockholder pressure towards managerial efficiency. A restatement then, of Pringle's point of view in light of the others might be as follows: to optimize shareholders wealth implies efficiencies in managing the capital position of an institution in such a way as to utilize that mix of debt and equity that would result in the lowest capital cost and, therefore the highest return to shareholders.

Pringle points out that a debt instrument performs a large portion of the role of equity capital. Debt has (or can have) a long and manageable maturity, but does not bear all the risks of equity. Debt capital does bear some risk due to its subordinated position to the principal liabilities of a bank (deposits), but since subordinated debt holders can force bankruptcy for lack of payment while equity holders cannot, there is a bias towards equity.

It appears clear that the question of insolvency or bankruptcy risk inherent in the fixed charge of debt capital is the fear or risk that is constantly implied or stated in the literature covering bank debentures. What is difficult to resolve is who really bears the risk. It appears a major portion is borne by the debt instrument holder, a lesser amount by shareholders and some by society. The latter is true because of the nature of deposit insurance and the loss (unquantifiable) to the community of a financial institution and the waves of fear that wash through the system in the case of insolvency.

Pringle's concluding comment leads directly to this research:

> As in the case of firms in general, the question of the optimal capital structure is an empirical one whose outcome is dependent on the effects of market imperfections.[1]

Pringle's implications in the above quotation and through his entire research is that capital (in the aggregate) is the question to be reviewed; the various sources of capital are not reviewed nor analyzed. He leaves it up to future research to examine the value or weakness of debt as a form of capital. This study will attempt to fill that void.

Specific Debt Capital Studies

The first thorough study of bank debt capital was undertaken by David W. Cole.[2] The study centered on the potential effects of senior capital on various bank objectives. He included preferred stock in his analysis but some of his analysis applies to this research. In one part, he extended Hawke's study by increasing the observation period and used a greater number of issues. He found Hawke's conclusions consistent with his extensions. The sale of senior debt securities had little effect on P/E ratios. Cole also compared two groups of banks--those that had issued debt capital (27 banks) and those that had not (34 banks). An analysis was made for the period March 1963 to September 1964 comparing earnings and prices. During that period average P/E's increased (1.4%) for debt group and earnings increased (7.9%). Non-debt banks had a decline in average P/E's (3.3%), but earnings increased (9.4%).

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[1]Pringle, "The Role of Capital," p. 203.

[2]David W. Cole, "Senior Securities in the Capital Structure of Commercial Banks (Ph.D. dissertation, Graduate School of Business, Indiana University, 1965).

Unfortunately, little can be derived from Cole's results. Average figures were used and they sheltered many items due to the wide distribution of the ratios. For instance, over half of the debt banks had a decrease in P/E's. In addition, due to lack of statistical significance in any of the results the effectiveness of that portion of the study is further reduced. But what Cole was asking has merit. For example, did leverage significantly increase earnings per share? Did the market react to the debt capital by placing a higher risk premium on the stock as shown by changes in the P/E ratios?

The last study to be reviewed is also the newest. In 1972 Julien Wade[1] conducted research to test the question of whether the decision to issue debt capital helped or hindered shareholders' wealth. He tested, therefore, whether the market did, in fact, discount stocks (that is demand a higher capitalization rate) for banks that had debt capital.

To make his analysis he developed a model using multiple regression and data on 92 large banks for five years (1963-67) to be used to predict P/E ratios.[2] The results generated three statistically significant variables for predicting the P/E of bank stocks--population growth, dividend payout, and instability of earnings.[3] His model

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[1]Julien J. Wade, "Senior Capital: Its Impact on the Value of Bank Common Shares" (Ph.D. dissertation, Business Administration, Stanford University, 1972).

[2]His five independent variables included dividend payout, stability of earnings, growth, quality of management, and debt policy. Ibid., p. 81.

[3]Instability of earnings was shown by the variance of earnings per share around the bank's average earnings trend plotted by regression. The resulting coefficients were negative supporting the expected behavior of risk-averse investors (i.e., preference for banks with stable earnings). Ibid., p. 149.

developed a statistically significant R^2 of about .40 (ranged from .28 to .44 for the sample period, based on his extremely high F-ratios). The debt question was analyzed via a dummy variable utilizing debt/non-debt that grouped the banks by capital structure. No significance was found between the P/E ratios of the groups. Wade suggests:

> . . . that within the debt/equity range of the banks in this sample, the use of senior capital by a bank did not cause common stockholders to significantly alter the capitalization rate they assigned to earnings.[1]

His implication, therefore, is that financial risk is manageable.

Unfortunately, one cannot accept Wade's research without certain reservations. Every year his population of debt/non-debt changed as more banks added debt therefore creating, it would seem, a bias in the study; and only in the last two years of his study were there many banks with debt capital.

His use of a dummy variable utilizing a zero (all equity) and one (debt) relations lacks any sensitivity for analysis. For instance, in the research he expands in detail the theoretical underpinnings for his research as based on the basic views of Modigliani and Miller versus the traditional theory as summarized by Solomon and Van Horne.[2] It is disappointing, therefore, that although he wants to compare the traditional view of debt with Modigliani and Miller's, his research

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[1]Ibid., p. 28.

[2]Merton Miller and Franco Modigliani, "The Cost of Capital, Corporation Finance, and the Theory of Investment," American Economic Review, vol. XLVIII (June, 1958), pp. 261-297; James C. Van Horne, Financial Management and Policy (2nd ed.), (Englewood Cliffs: Prentice-Hall, 1973); Ezra Solomon, The Theory of Financial Management (New York: Columbia University Press, 1963).

design appears to lack the breadth for his analysis. Specifically, the traditional view would suggest different reactions by the market depending on the level (amount) of debt in the capital structure. His analysis and design, therefore, should have included a measure of the amount (or proportion) of debt rather than the "all or none" dichotomy he adopted.

The critical question he was asking was what are ". . . the effects of a senior security issue on a bank's price/earnings multiple . . ."[1] At most, his analysis showed that there were no differences in price/earnings ratios between debt and non-debt banks. That result has value, but it would appear that more study is needed to examine in depth the question of debt capital. Decision makers want to know not only whether there are penalties in debt, but whether premiums differ with differing debt-equity mixes. Although not reviewed by Wade, there is a question as to whether the general profile or characteristics of banks differ according to their capital mix. This research will attempt to investigate both of those questions.

In summary, the empirical studies discussed above tend to confirm the following: (1) investors appear to place a definite value on dividend income, (2) debt does not seem to scare off depositors or investors, hence, financial risk has been manageable externally, and (3) leverage apparently has not been negative but it is unclear whether the wealth position of shareholders has increased. Areas lacking an answer include: (1) would a more definitive analysis of leverage identify premiums as well as penalties, (2) what impact does debt capital have on the asset and liability structure of the bank, and

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[1]Wade, p. 5; also see pages 3-4.

(3) is debt capital a rational and valued type of "capital"?

Summary

Many of the studies examined in this literature review only touched the debt capital question. They were included to show, among other things, the need for greater research on debt capital in banks. Time and laws have changed. Debt capital is a rapidly growing segment of the total capital structure of large commercial banks. The study proposed in this research looks directly at banks utilizing debt capital. The study will attempt to analyze the effects of debt capital on changes in the earning stream of the bank; its dividend decision; loan and deposit mix; and the market price of the common stock.

This section has set the stage for the full discussion of the research. The next chapter develops the complete research design. The remaining chapters will present the results of the analysis and summary section.

CHAPTER V

RESEARCH DESIGN AND DATA BASE

Introduction

This chapter presents the research design used in the research. The reasons a multivariate analysis of variance (MANOVA) with repeated measures is used and its merits over other techniques are discussed. In addition, in this section the data base and variables selected are explained and their criteria for selection shown.

Banks Included in the Study

There are approximately 14,000 banks in the United States. The banks chosen to be used in this research came from a list of the largest 150 by asset size at the end of 1972. The banks were initially selected because they are known to have a major impact on the banking industry. For example, the banks on the list controlled approximately 70% of the total assets in the system. They were the banks who would have the opportunity to reach the capital markets for funds and who were facing pressures for expanded capital.

After reviewing various listings[1] on these 150 banks a further refinement of the criteria for selection from the 150 was specified. Specifically, the criteria for selection were as follows:

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[1]For instance, Moody's Bank Manual, Polk's Bank Directory, NYSE and ASE Listings, Fortune's Bank Reports and others.

Non-Debt Banks	Debt Banks
1. No debt capital at any point in the period 1963-1972.	1. Debt capital outstanding during 1970-1972.
2. Complete data for every variable for the period reviewed.	2. Initial debt capital offering prior to 1970.
	3. Complete data for every variable reviewed.

The final selection used the Compustat Bank Tapes.[1] These tapes contain 107 banks with data for a ten year period ending December 1972. The size of these banks meets the requirements of being in the largest 150 banks in the United States. The file also contains a mix of state and national banks.

The tapes yielded 88 banks that meet all the criteria necessary to be included in the study. Of these 88, 65 fit the debt definition and 23 met the non-debt definition. As part of the analysis the banks were further classified by the amount (level) of debt in their capital structure as follows:

Level (1)	Low	Less than 15% of debt to total capital funds
Level (2)	Medium	15% to 30% of debt to total capital funds
Level (3)	High	Greater than 30% of debt to total capital funds

Debt is the result of a specific management decision and the relative size of the debt issues may very well indicate a distinct attitude on other financial characteristics. Banks using high levels of debt capital, for example, obviously are different at least in that respect from their industry counterparts who used little or none. Therefore, to see the possibility of subtle changes due to different levels of debt, levels were determined; it was found that debt ranged from approximately 10% to 45% of total capital. A logical split was to

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[1] Investors Management Services, Inc. (Englewood, Colorado: June, 1973).

review the debt levels in increments of one-third. In addition, the splitting of the relatively large group (65 debt banks) into groups of more equal size appeared to lend more sensitivity to an analysis. Therefore, three levels created groups of about the same size and also equally split the range of debt to capital actually seen in the banks studied.

The total of 88 banks used in the study are shown by location and structure for each specific debt level in Tables 2 through 4.[1] Table 5 gives the breakdown of non-debt banks. The location code refers to the six geographic regions frequently utilized to sort banks for analysis. The structure code refers to whether the bank, as of December 31, 1972 was a multibank holding company (MB), a one bank holding company (OB), or a single commercial bank (CB). This breakdown indicates that the banks used in the analysis, although not equally split by location, structure or asset size are, conversely, not particularly concentrated. Therefore, the classifications utilized created several groups each one of which is representative of large banks.

In regard to structure, single bank versus holding company, it should be noted that the financial statements utilized in this analysis were in bank format. SEC regulations, as they relate to 10-K forms and Article 9 of Regulation S-X, and various regulations of the Board of Governors of the Federal Reserve System (particularly Regulation F) effectively leads all major banks in the United States to report their

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[1]There are 25 Level (1) banks; 24 Level (2) banks; and 16 Level (3) banks.

TABLE 2

SAMPLE BANKS IN STUDY BY LOCATION, SIZE AND DEBT LEVEL

Location Code	Debt Banks[a] - Level 1[b]	Structure Code
1	Citi-Corp.	OB
1	Manufacturers Hanover Corp.	OB
1	Harris Trust	OB
2	Baystate Corp.	MB
2	CBT Corp.	MB
2	Continental Bank - Norristown	CB
2	Hospital Trust	MB
2	PNB Corp.	OB
3	American Security & Trust	CB
3	Citizen & Southern	OB
3	Maryland National Corp.	OB
3	Wachovia Corp.	OB
4	American Fletcher Corp.	OB
4	First Union, Inc.	MB
4	Marine Corp.	MB
4	Marshall & Iisley Corp.	MB
4	Mercantile Bancorp.	OB
4	Northwest Bancorp.	MB
4	Society Corp.	OB
5	First National Bancorp.	OB
5	Mercantile National - Dallas	CB
5	Southwest Bancshares	OB
5	United Banks of Colorado	MB
6	Bankamerica Corp.	CB

SOURCE: Compustat Bank Tapes (June, 1973) and Moody's Bank and Financial Manual - 1973.

[a]These classifications are as of 12-31-72 and in Level 1 there are 25 banks.

[b]Level 1: Average debt less than 15% of total capital

Location Code: 1 = Money Center Banks; 2 = Eastern Regional Banks; 3 = Southeastern Regional Banks; 4 = Midwestern Regional Banks; 5 = Southwestern Regional Banks; 6 = West Coast Regional Banks

Structure Code: MB = Multibank Holding Co.; OB = One Bank Holding Co.; CB = A Commercial Bank

TABLE 3

SAMPLE BANKS IN STUDY BY LOCATION, SIZE AND DEBT LEVEL

Location Code	Debt Banks[c] - Level 2[d]	Structure Code
1	Bank of New York	MB
1	Bankers Trust	MB
1	Charter New York Corp.	MB
1	Chemical New York Corp.	MB
1	J. P. Morgan & Co.	OB
1	First Chicago Corp.	OB
1	State Street Boston Financial	OB
2	First Pennsylvania Corp.	OB
2	Hartford National Trust	OB
2	Franklin New York Corp.	OB
2	Marine Midland Banks	MB
2	New England Merchants	OB
3	Barnett Banks of Florida	MB
3	First National Holding Corp. of Atlanta	OB
3	First Tennessee National	OB
3	Virginia National Bankshares	MB
4	Centran Bancshares - Holding Co.	MB
4	Manufacturers National Bank - Detroit	CB
4	National Bank of Detroit	CB
6	Bancol Tri-State Corp.	OB
6	Hawaii Bancorp. Inc.	OB
6	South California First National	OB
6	Wells Fargo	OB
6	Western Bancorp.	MB

SOURCE: Compustat Bank Tapes (June, 1973) and Moody's Bank and Financial Manual - 1973.

[c]These classifications are as of 12-31-72 and in Level 2 there are 24 banks.

[d]Level 2: Average debt greater than 15% and less than 30% of total capital.

Location Code: 1 = Money Center Banks; 2 = Eastern Regional Banks; 3 = Southeastern Regional Banks; 4 = Midwestern Regional Banks; 5 = Southwestern Regional Banks; 6 = West Coast Regional Banks

Structure Code: MB = Multibank Holding Co.; OB = One Bank Holding Co.; CB = A Commercial Bank

TABLE 4

SAMPLE BANKS IN STUDY BY LOCATION, SIZE AND DEBT LEVEL

Location Code	Debt Banks[e] - Level 3[f]	Structure Code
1	Chase Manhattan	OB
2	Fidelity Corp. - Penn.	OB
2	First Empire State - N.Y	MB
2	First National State Bancorp. - N.Y.	MB
2	Girard Trust	OB
2	Industrial National Corp.	OB
2	Lincoln First Banks	MB
2	United Jersey Banks	MB
3	Cameron Financial Corp.	OB
3	First & Merchants	OB
3	NCNB Corp.	OB
3	Southeast Banking Corp.	MB
3	United Virginia Bankshares	MB
4	Equimark Corp.	OB
4	First Wisconsin Bankshares	MB
6	Crocker National Corp.	OB

SOURCE: Compustat Bank Tapes (June, 1973) and Moody's Bank and Financial Manual - 1973.

[e]These classifications are as of 12-31-72 and in Level 3 there are 16 banks.

[f]Level 3: Average debt greater than 30% of total capital.

Location Code: 1 = Money Center Banks; 2 = Eastern Regional Banks; 3 = Southeastern Regional Banks; 4 = Midwestern Regional Banks; 5 = Southwestern Regional Banks; 6 = West Coast Regional Banks

Structure Code: MB = Multibank Holding Co.; OB = One Bank Holding Co.; CB = A Commercial Bank

TABLE 5

SAMPLE BANKS IN STUDY BY LOCATION, SIZE AND DEBT LEVEL

Location Code	Non-Debt Banks[g]	Structure Code
1	Mellon National Corp.	OB
2	Philadelphia National Corp.	OB
2	Fidelity Union (N.J.)	MB
3	Alabama Bancorp.	MB
3	First National of Maryland	CB
3	Riggs National (D.C.)	CB
3	Trust Company of Georgia	OB
4	Cleveland Trust Bank	CB
4	Commerce Bank Shares	OB
4	Detroit Bank & Trust Corp.	OB
4	First Bank Systems (Minn.)	MB
4	First National of Cincinnati	CB
4	Indiana National	OB
4	National City (Cleveland)	CB
4	Pittsburgh National	OB
5	Colorado National Bank Shares	MB
5	First City Bancorp. (Texas)	OB
5	First International Bank Shares (Dallas)	MB
5	Republic National Bank (Dallas)	CB
5	Texas Commerce Bank Shares	OB
6	Marine Bancorp.	OB
6	First National Bank of Seattle	CB
6	Security Pacific Corp.	OB

SOURCE: Compustat Bank Tapes (June, 1973) and Moody's Bank and Financial Manual - 1973.

[g]These classifications are as of 12-31-72 and there are 23 non-debt banks.

Location Code: 1 = Money Center Banks; 2 = Eastern Regional Banks; 3 = Southeastern Regional Banks; 4 = Midwestern Regional Banks; 5 = Southwestern Regional Banks; 6 = West Coast Regional Banks

Structure Code: MB = Multibank Holding Co.; OB = One Bank Holding Co.; CB = A Commercial Bank

operations in a standardized commercial bank format.[1]

The selection of the time period in this study was shaped by the need to obtain a meaningful group of large commercial banks containing complete data for the period; and to be current enough for meaningful analysis. The choice of years 1971 and 1972 best met that criterion. The banks that issued debt had time for it to impact and there was a representative group of non-debt banks that could be compared. Selections of longer periods drastically reduced the sample. For example, the 88 utilized reduced to 46 when the time period was expanded to include 1969.

Compustat Tapes also offer a high degree of accuracy and consistency in formation. However, as a check, footnotes to the data were reviewed and the basic variables used in the analysis were analyzed as to completeness and accuracy. Specifically, a random selection of four variables for thirty banks was compared to Moody's and respective stock exchange sources for random years prior to the period investigated and for both 1971 and 1972 for any errors. None were found and it is felt that the data are an accurate picture of financial data required for this study.

Variables

The selection of the variables used in this study began with a review of ratio analysis as expressed in the authoritative references by John Myer and Roy Foulke.[2] From that development an examination of

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[1]Ernst and Ernst, Financial Reporting Trends: Banking 1972 and 1973 (1300 Union Commerce Building, Cleveland: Ernst and Ernst, C.P.A.s), pp. 170-171.

[2]John M. Myer, Financial Statement Analysis, 4th ed., and Roy A. Foulke, Practical Financial Statement Analysis, 6th ed.

variables (ratios or indexes) used within the banking industry was undertaken. Writers like David Cates, Richard Cotter and Wesley Lindow[1] who have written extensively on banking from their viewpoints as a bank consultant, banking professor and senior bank economist respectively, were researched. Finally, studies utilizing ratios and indexes by Edward Altman, Robert Dince and James Forston, and David Durand,[2] were examined for their selections of variables.

The above research led to the development of approximately 30 potential variables. To reduce the number to a group that would be the most sensitive and develop the best profile of the financial characteristics of the firm, three steps were employed. First, variables that appeared redundant in a bank analysis were eliminated. For example, a measure of liquidity, like cash and U.S. Governments to assets has little impact because large banks are effectively constrained by the market place and regulations and the results would be expected to be the same among all large banks. Secondly, if data were not consistently available for the banks studied, the variable could not be used. For instance, a breakdown of the loan or investment portfolio was impossible

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[1]See David C. Cates, "Bank Capital Management," The Bankers Magazine (Winter, 1973), pp. 87-90; Richard V. Cotter, "Capital Ratios and Capital Adequacy," The National Banking Review (March, 1966), pp. 333-346; and Wesley Lindow, "Bank Capital and Risk Assets," The National Banking Review (September, 1963), pp. 29-46.

[2]Edward I. Altman, "Financial Ratios, Discriminant Analysis and the Prediction of Corporate Bankruptcy," The Journal of Finance (September, 1968), pp. 589-609; Robert R. Dince and J. C. Fortson, "The Use of Discriminate Analysis to Predict the Capital Adequacy of Commercial Banks," Journal of Bank Research (Spring, 1972), pp. 54-62; and Durand, Bank Stock Prices and the Bank Capital Problems.

to develop because of lack of data and, therefore, only investment totals could be used in the analysis. Finally, a standard statistical package was run on the data resulting in calculations of the mean, standard deviation, variance, and simple correlations. Analysis of these statistics on an a priori basis eliminated those variables that showed little promise for meaning.

After reviewing the variables and data via the screening described above, an a priori selection of twelve measures of financial characteristics (eight ratios and four indexes) was prepared and used in this study. They are presented in Table 6.[1] The examination of the financial characteristics as shown by the ratios developed, will give insight whether there are differences between banks utilizing debt and those with all equity basis. The differences to be examined involve basic policies of banks including their short term debt position, risk asset ratios, dividend payout, loan policy, and liability management.

Because of the large amount of data on the Compustat Tapes and the possible chance of error in transferring the data from the tapes a test was developed as an error control. From the approximately 2,100 observations generated (2 years x 12 variables x 88 banks) approximately 20% of the banks were selected at random for each year (20 banks) and a random choice of 6 variables for each bank were calculated by hand to verify the accuracy of the programming used to transform the data from the Compustat Tapes. There were no differences found between the program results and the hand verified results.

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[1]Complete definitions of terms used in the variables are found in Appendix A.

TABLE 6

FINANCIAL CHARACTERISTICS UTILIZED
AS DEPENDENT VARIABLES

V_1	$\frac{\text{Net Current Operating Income}}{\text{Average Total Assets}}$	V_7	$\frac{\text{Average Market Price}}{\text{Net Current Operating Income}}$
V_2	$\frac{\text{Net Current Operating Income}}{\text{Average Total Equity}}$	V_8	$\frac{\text{Short Term Debt}}{\text{Average Total Capital}}$
V_3	$\frac{\text{Average Total Loans}}{\text{Average Total Assets}}$	V_9	Equity Growth
V_4	$\frac{\text{Average Total Loans}}{\text{Average Total Deposits}}$	V_{10}	$\frac{\text{Average Total Capital}}{\text{Risk Assets}}$
V_5	Dividend Payout Ratio	V_{11}	Average Deposit Growth
V_6	Dividend Growth	V_{12}	Average Loan Growth

In this research as in the previously cited studies, the actual selection or development of the particular variables (ratios and indexes) used resulted from a view of their importance as indicators of financial qualities or characteristics. They are designed to clarify certain features of banks. Conceptually, time and debt/non-debt are viewed as the independent variables. The ratios and indexes are the dependent variables. The asset and liability mix will be examined by looking at loans as a percent of assets (V_3), loans to deposits (V_4), short term debt to capital (V_8), capital to risk assets (V_{10}), and deposit and loan growth earnings (V_{11} and V_{12}). Profitability will be analyzed by examining operating income as a ratio to assets and equity (V_1 and V_2), and equity growth (V_9). Dividend policy is reviewed via the payout ratio (V_5) and dividend growth (V_6). Stock market reaction (market perception) is reviewed by examining the price earnings ratio (V_7).

The role of ratio analysis in the area of finance (particularly in credit and investment analysis) is basic. Unfortunately its current use, as a tool for analysis, has been downplayed and current literature displays a fascination with more elaborate statistical techniques. Continued use of the computer has resulted in aggressive use of some of the statistical tools in combination with ratio analysis. This combination appears to have many virtues and these were clearly expressed by Altman.[1] Since his article on corporate bankruptcy appeared, many

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[1]Edward I. Altman, "Financial Ratios, Discriminant Analysis and the Prediction of Corporate Bankruptcy," Journal of Finance (September 1968), pp. 589-609.

writers have pursued his lead using ratios and indexes in multivariate models.[1] The next chapter will expand on the use of the multivariate models in this research.

The Model

With the explanation for the selection of variables, time frame and population complete, it is appropriate to turn to an explicit statement of the model to be used to analyze the data. The model chosen here is the multivariate analysis of variance (MANOVA). The MANOVA model differs from more familiar analysis of variance (ANOVA) models in that it concerns more than one independent variable (in this study the multivariables are debt/non-debt and time); and the dependent variables are "Vector variables."[2] Cooley and Lohnes point out that ". . . the research issues concern the realness of the differences among the . . . mean vectors. That is, the research issue concern whether some or all of the populations are centered at different locations in the measurement space spanned by the dependent Vector variables."[3] Therefore, if the banks have statistically significant different mean vectors then it can be said they are from different populations; i.e., if there are differences in the financial profiles, the banks containing debt capital

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[1]See, for instance, R. R. Dince and J. C. Fortson, "The Use of Discriminant Analysis to Predict the Capital Adequacy of Commercial Banks," Journal of Bank Research (Winter, 1972), pp. 54-62; C. R. Carlson, "A Financial Efficiency Model," (Ph.D. dissertation, Michigan State University, 1971); D. L. Stevens, "A Multivariate Analysis of Financial Characteristics of Acquisitions on Bank Performance," Staff Economic Studies, no. 69 (Board of Governors of the Federal Reserve System), 1972.

[2]William W. Cooley and Paul R. Lohnes, Multivariate Data Analysis (New York: John Wiley and Sons, Inc., 1971), pp. 222-224.

[3]Ibid., p. 224.

are different from all-equity banks.

Standard notation of the model is:[1]

$$X_{ki} = M + (M_k - M) + (X_{ki} - M_k)$$

where X_{ki} = the dependent vector for the ith subject in the kth sample, k = 1, 2, . . ., g, where g is the number of populations under study, M = Vector of total sample means; M_k = the Vector for Sample k.

A complete development of the MANOVA model is beyond the scope of this research but the reader is referred to the authoritative texts by Cooley and Lohnes and John Neter and William Wasserman for a complete explanation of MANOVA analysis.[2]

Time is a variable that can strongly affect any analysis. In the design of the model used in this research, time is examined directly by its incorporation as an independent variable. Therefore, with time explicitly examined debt over more than one time period can be individually analyzed. The MANOVA model will look at debt and time separately and then review any possible interactions between debt and time. It is believed there will be no interaction. If interaction occurs additional techniques suggested in the literature will have to be applied as part of the analysis. Neter and Wasserman summarize the strength of such a model as follows: "The significance of no factor interaction is that the effects of the two factors can be described separately . . ."[3] A discussion of those techniques is not relevant in this research as interactions were not observed.

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[1]Ibid., p. 224-225.

[2]Ibid., and John Neter and William Wasserman, Applied Linear Statistical Models (Homewood, Illinois: Richard D. Irwin, Inc., 1974).

[3]Ibid., p. 557.

Data was gathered for two time periods (1971 and 1972) and for four debt classifications (0, 1, 2, 3). The 0 debt classification is reserved for non-debt banks and the (1, 2, 3) debt classifications are reserved for those banks with certain levels of debt as defined previously.

The MANOVA model is chosen over other linear models such as regression analysis or discriminant analysis for many reasons. "Multifactor studies are more efficient than the traditional experimental design of manipulating only one factor at a time and keeping all other conditions constant."[1] The MANOVA is more general than regression techniques. It is a basic type of linear statistical model. Like regression, MANOVA is concerned with the relationship between a dependent variable and one or more independent variables. The dependent variable, as in regression analysis, is quantitative. The two main simplifying differences between MANOVA and regression are that (1) the MANOVA accepts qualitative independent variables and (2) the MANOVA requires no a priori statistical relation between the dependent and independent variables. Thus, specification problems as they relate to regression models, are not encountered. MANOVA then is closer to correlation analysis than to regression analysis.

A traditional regression model also gives less information than the MANOVA. The typical regression model can only analyze one factor at a time while the MANOVA can examine each factor level and the interactions between the factors. If the traditional regression model were

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[1]Ibid. Much of the explanation of the advantages of MANOVA is discussed in the above reference, see especially pp. 419-22, and 549-567.

to be employed, a larger sample size would be required than with the MANOVA.[1] Even then, it would not allow an examination of the interaction effects.

The specific use of MANOVA in this research is, as Hays states, ". . . as a device for 'sorting' the information in an experiment into non-overlapping and meaningful portions."[2] The two samples will be analyzed with the MANOVA giving ". . . a rapid means of testing the null hypothesis that (the) groups derive from a common population."[3] Basically, if the variations (or the variance) between groups are statistically different (greater) than those within them, then the groups are probably from different populations.[4] As can be deduced, this research will, in effect, develop a "profile analysis," via ex-post analysis of the mean differences (or lack of differences) for banks with debt and those without.[5]

The appropriate test statistic that will be used to indicate statistical significance or lack thereof is Rao's F which is an

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[1]Ibid., p. 552.

[2]William L. Hays, Statistics for Psychologists (New York: Holt, Rinehart and Winston, 1963), p. 409.

[3]T. G. Connolly and W. Sluckin, An Introduction to Statistics for Social Sciences (New York: St. Martin Press, 1969), p. 154.

[4]Ibid., p. 155.

[5]"Profile analysis" is, as Nunnally puts it, ". . . a generic term for all methods of groupings . . . with a class of analysis being one in which the groups are known in advance of the analysis and the purpose is to distinguish the groups from one another . . ." Jum C. Nunnally, Psychometric Theory (New York: McGraw-Hill, Inc., 1967), pp. 377-378.

approximation of Wilks' Lambda.[1] Rao's F distribution follows closely the standard F ratio and allows for the testing of the equality of all treatment means, debt effects, time effects and interaction effects.

The MANOVA program utilized in this research is based on Jeremy D. Finn's multivariance program[2] as modified for the CDC 6500 by Scheifley and Schmidt.[3]

This program uses a step-wise procedure to perform a multivariate analysis of variance. Specifically, the procedure is similar to any step-wise linear model. The algorithm involves the reexamination at every step of the analysis of the variables entered in the model in earlier steps.

As mentioned earlier in the chapter, the F-test is the appropriate statistic for use in this analysis. The computer program used to analyze the data set in this study requires that attention be paid to the order of the variables. Specifically, the program begins by developing

> . . . a univariate and step-down multiple correlation analysis, to determine the relationship between the independent variables and the individual dependent measures. Second, a step-wise

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[1]Cooley and Lohnes, Ibid., p. 227. See also, Donald F. Morrison, Multivariate Statistical Methods (New York: McGraw-Hill Book Company, 1967), p. 174; and Neter and Wasserman, pp. 579-84.

[2]Jeremy D. Finn, Multivariance: Univariate and Multivariate Analysis of Variance, Covariance and Regression (Ann Arbor, Michigan: National Education Resources, Inc., March, 1972).

[3]Verda M. Scheifley and W. H. Schmidt, Univariate and Multivariate Analysis of Variance, Covariance and Regression: Occasional Paper No. 22, (East Lansing, Michigan: School for Advanced Studies, College of Education, Michigan State University, October, 1973).

[4]Ibid., p. 4, and N. R. Draper and H. Smith, Applied Regression Analysis (New York: John Wiley and Sons, Inc., 1966), p. 171.

> univariate and multivariate multiple regression analysis is performed to determine the effects of the individual independent variables (or set of independent variables; i.e., predictors may be entered into the regression equation singly or in groups). In all cases the order of both sets of variables is determined by the user prior to the computer run.[1]
>
> The ordering question, therefore, rests on the shoulders of the researcher. A variable which may have been the best single variable to enter at an early stage may, at a later stage, be superfluous because of the relationship between it and the other variables now in the analysis.[2]

To check the potential problem quoted above, the step-down F ratio for each variable in the analysis at any stage in the calculation is evaluated and compared with a specified F ratio. This allows a judgment as to the "contribution" made by each variable as though it had been the most recent variable entered.[3] Thus, ". . . the order must be determined by the user on an a priori basis."[4]

In this research the desired a priori ordering was formulated empirically on the basis of the variables' sensitivity to debt effects. The difficulty, though, in selecting the precise ordering of so many variables was felt to be too critical for a totally subjective decision. Therefore, to more precisely evaluate the ordering a technique suggested by Cooley and Lohnes was utilized.[5] A MANOVA was run analyzing each group of banks for each year by debt levels to test for the debt effect.

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[1]Scheifley and Schmidt, p. 4.

[2]Draper and Smith, p. 171.

[3]Ibid., p. 171.

[4]Scheifley and Smith, p. 5.

[5]This is suggested in Cooley and Lohnes, Multivariate Data Analysis, p. 230. The univariate F's are presented in Tables 12, 13, and 14 in Chapter VI.

The results were as follows (with degrees of freedom of 12 and 73):

Level	F-Ratio	Significance
1	.7566	.6919
2	1.8306	.0587
3	6.3949	.0001

The banks in Level 3, containing the largest amount of debt capital, showed a strikingly significant difference when contrasted to non-debt banks. Therefore, the univariate F from Level 3 was used to determine the final ordering of all 12 variables.

The total set of twelve variables, when analyzed over the total period, contrasted by levels of debt produced six variables found to be significant when compared to banks with no debt capital.[1] The analysis of these variables and their interpretation is developed in the following chapter.

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[1]Included in the six were variable (1) net current operating income/total assets; (2) net current operating income/total equity; (4) average total loans/average total deposits; (5) dividend payout; (8) short term debt/total capital; and (10) average total capital/risk assets. (See Table 6 for all 12 variables.) The analysis of the variables are discussed in detail in the following chapter.

CHAPTER VI

ANALYSIS OF RESEARCH RESULTS

Overview

This chapter presents the results of the research. This section presents an overview of the research. Discussion begins with the definition of the tables and a look at the overall research results. From that point an analysis of the results by the three levels of debt compared to banks containing no debt capital is presented. Within that analysis, profiles of the banks, by debt/non-debt levels, is presented. The final section compares and summarizes the respective profiles.

The statistics are presented in table format and include the means and F-ratios for each variable by the effect of debt, time and debt/time interaction. The nine tables presented include three containing means by levels of debt, by time periods and combined over time by debt levels. The remaining six tables present the results of the multivariate analysis of variance (MANOVA) and the components by giving the F-ratios and their significance.

The .05 confidence level was selected as the critical level for acceptance/rejection of the mean relationships. The level was felt to be high enough to minimize the risk of Type I or Type II errors[1] and is

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[1]See Charles T. Clark and L. L. Schkade, Statistical Analysis for Administrative Decisions (Cincinnati: South-Western Publishing Co., 1974), pp. 405-421 for a discussion on Type I and II errors.

frequently a criteria utilized in the financial literature.

This research focuses on the question of whether there are differences between large commercial banks containing debt capital and large commercial banks having an all equity capital position; and, if so, where do the differences appear. The analysis of the debt effect is approached by reviewing banks by levels of the concentration of debt in their capital structure. Those containing less than 15% of debt/total capital funds were classified Level 1 banks. Level 2 and 3 were banks containing moderate amounts of debt (15% to 30%) or high amounts of debt/total capital (over 30%) respectively.

The results of the analysis described in this section indicates that there are significant differences in some financial characteristics between banks containing debt capital and those that do not. The impact of debt does vary with the debt concentration. Banks with lower debt levels, for example, appear to be generally indistinguishable from those containing all equity capital, yet banks containing larger amounts of debt capital have significant differences. The analyses of the differences are explained in the following pages after a summary of the tables.

Profile Analysis

The principal data tables presented in this chapter result from the previously discussed research design. They fall into two categories: the presentation of the appropriate test statistic, the F-ratio;[1] and the means. The first table presented, Table 7, presents the overall results of the research. Table 7 shows the effect of debt (by levels)

[1]Morrison, Multivariate Statistical Methods, p. 174.

and is measured by individually contrasting each group (level) of debt banks to the non-debt capital bank sub-group. In addition, the possible interaction of debt and time is presented as well as the effect of time. The results show the expected effect of time (when looked at separately), which is highly significant; and the hoped for result of no interaction between debt and time is also presented.

As was discussed in the previous chapter, the result of no interaction between debt and time simplifies the analysis. The very low F-ratio of .4810 with its significance level of .9958 indicates a relationship of no statistical strength. If there was an interaction between debt and time any analysis would require the sorting out of the joint effect. With no interaction the analysis can ignore the time effect.

Tables 8, 9, and 10 present the means by debt levels, by time period and combined overtime. Table 8 presents the combined means (i.e., combined refers to both years being averaged together) by variable and by level of debt. Table 9 combines all banks in the study and presents means split by variable and time period. Table 10 expands on the previous tables and presents by means by both time period and debt levels for each variable.

Tables 11 through 16 split into two groups: Tables 11, 12, and 13 present raw univariate and F's and the step-down F with its corresponding significant level for the first period (1971). The univariate F was reviewed to arrive at an a priori ordering of the variables for the final MANOVA analysis.[1] As explained, the ordering

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[1]This was discussed in the previous chapter and is based on a technique suggested by Cooley and Lohnes, Multivariate Data Analysis, p. 230.

was based on the Table 13 univariate F's because Level 3 banks showed the highest F-ratio for overall debt effect. Table 11 and 12 are presented for completeness and comparison. The step-down F is presented principally for consistency with the remaining tables.

Tables 14, 15, and 16 present the results of MANOVA by each debt level. The titles on the Tables specify the analysis as a "step-down multiple correlation analysis." As explained in the previous chapter, the MANOVA technique is much closer to correlation analysis than regression analysis, hence the title of the tables. Step-down is a procedure similar to the traditional step-wise technique used in regression analysis. The method examines, in a sense, each variable.[1] Step-down more specifically examines the variables individually and in order from 1st through 12th with each variable being tested for significance while holding the remaining variables constant. Thereafter, the analysis of the step-down F proceeds as usual in examining the resulting significant levels in light of a critical level which in this analysis was selected as .05.

The overall multivariate test (Table 7) shows that for the sample of banks examined in this research and within the time constraints imposed banks containing debt capital have a different financial profile than non-debt capital banks. The MANOVA design in analyzing the banks by their capital make up also examined the effects of time and the interaction of debt and time.[2] This analysis, presented in Table 7,

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[1]See Neter and Wasserman, Applied Linear Statistical Models, p. 382, for a discussion of the step-wise technique.

[2]Ibid., pp. 419-422.

TABLE 7

OVERALL F-TESTS ON ALL VARIABLES BY LEVELS OF DEBT TESTING THE DEBT AND TIME EFFECT AND CONTRASTED TO NON-DEBT BANKS

Level	F-Ratio[a]	Significance[b]
	Debt Effect	
1	1.7369 (12,157)	.0638
2	4.5334 (12,157)	.0001
3	23.6102 (12,157)	.0001
	Debt/Time Interaction Effect	
All Levels	.4810 (36,464)	.9958
	Overall Time Effect	
All Levels	179.5938 (36,464)	.0001

[a]Degrees of freedom are shown in parentheses after appropriate F-ratio.

[b]The smaller the number the greater the significant level. For example, .0001 indicates a very high statistical significance while .9958 shows almost no significant difference is observed between the populations.

TABLE 8

COMBINED MEANS FOR BOTH TIME PERIODS FOR EACH DEPENDENT VARIABLE BY LEVELS OF DEBT

	Variable	Low Debt Level 1	Medium Debt Level 2	High Debt Level 3	Non-Debt
V_1	Net Current Operating Income / Average Total Assets	.0085	.0066	.0074	.0090
V_2	Net Current Operating Income / Average Total Equity	.1255	.1222	.1358	.1249
V_3	Average Total Loans / Average Total Assets	.5708	.5575	.5622	.5579
V_4	Average Total Loans / Average Total Deposits	.6852	.6647	.6868	.6602
V_5	Dividend Payout Ratio	.4290	.4554	.4317	.4111
V_6	Dividend Growth	.0470	.0481	.0630	.0608
V_7	Average Market Price / Net Current Operating Income	11.3100	11.8200	11.3900	11.3800
V_8	Short Term Debt / Average Total Capital	.9916	1.0650	.9456	1.2860
V_9	Equity Growth	.0765	.0686	.0906	.0755
V_{10}	Average Total Capital / Risk Assets	.1038	.0960	.1039	.1021
V_{11}	Average Deposit Growth	.1182	.1312	.1423	.1230
V_{12}	Average Loan Growth	.1102	.1240	.1456	.1219

TABLE 9

COMBINED MEANS FOR DEPENDENT VARIABLES BY EACH TIME PERIOD ACROSS ALL BANKS SAMPLED

Variable	Time Period 1	Time Period 2
V1	.0081	.0077
V2	.1278	.1264
V3	.5547	.5695
V4	.6666	.6818
V5	.4382	.4253
V6	.0709	.0385
V7	11.1100	11.8400
V8	.9672	1.1770
V9	.0799	.0757
V10	.1018	.1010
V11	.1082	.1391
V12	.1035	.1473

TABLE 10

MEANS BY DEBT LEVEL AND TIME PERIOD
FOR DEPENDENT VARIABLES

	Variable	Time	Level 1	Level 2	Level 3	Non-Debt
V_1	Net Current Operating Income / Average Total Assets	1	.0087	.0068	.0077	.0092
		2	.0082	.0064	.0071	.0089
V_2	Net Current Operating Income / Average Total Equity	1	.1267	.1236	.1366	.1244
		2	.1243	.1207	.1350	.1254
V_3	Average Total Loans / Average Total Assets	1	.5626	.5481	.5560	.5522
		2	.5790	.5670	.5684	.5636
V_4	Average Total Loans / Average Total Deposits	1	.6789	.6588	.6722	.6564
		2	.6915	.6706	.7013	.6639
V_5	Dividend Payout Ratio	1	.4360	.4527	.4414	.4228
		2	.4221	.4581	.4219	.3993
V_6	Dividend Growth	1	.0687	.0537	.0842	.0770
		2	.0253	.0425	.0417	.0446
V_7	Average Market Price / Net Current Operating Income	1	11.0600	11.1200	11.3300	10.9300
		2	11.5700	12.5200	11.4500	11.8300
V_8	Short Term Debt / Average Total Capital	1	.8826	.9809	.8449	1.1600
		2	1.1007	1.1490	1.0462	1.4120
V_9	Equity Growth	1	.0823	.0744	.0874	.0756
		2	.0708	.0630	.0937	.0754
V_{10}	Average Total Capital / Risk Assets	1	.1057	.0949	.1026	.1042
		2	.1018	.0972	.1052	.0999
V_{11}	Average Deposit Growth	1	.1078	.1168	.1283	.1202
		2	.1285	.1457	.1563	.1258
V_{12}	Average Loan Growth	1	.0861	.1029	.1149	.1103
		2	.1343	.1451	.1763	.1334

indicates an expected time effect but no interaction between debt and time. The lack of interaction makes the analysis much less complex as it allows examination of debt effect without consideration for time effects.[1]

The debt effect, examined by levels of debt in the capital structure of the sample banks contrasted with banks containing no debt capital shows a significant difference, at the .05 level, for banks in Level 2 and 3. The analysis of possible sources of the differences in these profiles is developed in this section.

The Low Debt Profile

Level 1 banks, although not meeting the .05 cutoff level (see Table 7) with a multivariate F-ratio of 1.7369, require analysis for a consistent presentation of the research.

The size of the sample of banks comparing 25 Level 1 banks in contrast to 23 non-debt banks, is by chance almost identical. A brief review of the means for Level 1 banks is presented in Table 8 (combined over time) and Table 10 (by year). The means show few obvious differences and tend to imply Level 1 and banks containing all equity capital may be from the same population. These results appear to be what would be expected for the following reasons. The absolute impact of up to 15% of total capital in the form of debt capital translate to slightly less than 1% of assets--an amount that would not be expected to exert a great effect on the overall performance of a bank. In addition, the expected effect of debt capital would also appear to be a function of

[1]Ibid., p. 577 and Morrison, Multivariate Statistical Methods, p. 174.

its term. All else being equal, the longer an issue is outstanding the greater the chance for structural leverage to show an impact.[1] In addition, the longer a debt issue was outstanding the lower was its coupon rate. The older bonds carried lower interest rates because of favorable market conditions existing (low market rates of interest) when the issues were sold. Review of the banks studied indicates that most banks in Level 1 did not sell bonds until 1969. Therefore, by being relatively new users of debt capital they did not benefit from low rates available, for example, in the 1964-1967 period; nor did they enjoy the compounding effect of structural leverage.

On the other hand, the significance level for Level 1 banks was not greatly above the .05 critical level with a .0638 score. The step-down correlations (Table 14) indicate that three variables contribute most strongly to the overall F:[2] V_1--operating income to total assets; V_2--operating income to equity; and V_{10}--total capital to risk assets.

Examining the components of V_1 and V_2, suggests an answer to the strength of those variables. The Level 1 debt banks have slightly lower earnings to assets (8.5% to 9.0%; see Table 8) and that is not unexpected. Interest on debt is subtracted from operating earnings to arrive at net current operating income (NCOI). Therefore, since debt banks by definition have interest charges on long term debt and non-debt

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[1]Cates, "Bank Debentures . . .," p. 22.

[2]V_1 F-ratio 5.4652 with .0206 significance level;
V_2 F-ratio 4.8978 with .0283 significance level;
V_{10} F-ratio 5.8067 with .0172 significance level.

capital banks do not we would expect a lower NCOI.

In the measurement of financial leverage, though, we would expect in a well-managed firm positive leverage resulting in a greater return on stockholders equity. Table 8 shows that Level 1 banks do have a slightly greater return on equity--12.55% to 12.49%. But, as previously discussed, the effect of leverage was not hypothesized to be large given the low amount of debt capital relative to the size of the firm or to total capital.

The examination of V_{10}, total capital to risk assets, completes the review of the three variables contributing to the rejected F score. Debt banks when using subordinated debt capital have a better cushion of total capital than do non-debt capital banks (10.38% to 10.21%). The difference is small but statistically significant in the step-down analysis. The contribution variables V_1, V_2, and V_{10} make toward the overall F score are impossible to calculate precisely. What can be stated is that the above three variables appear to be the principal components in differentiating the two groups (low debt and all equity banks). The analysis of those variables indicate that though there are no statistically significant differences between the two groups, in respect to the three variables they highlight potential differences that may be of importance as the remaining sub-groups are reviewed.

The following analysis will review the significant differences in profiles between the Level 2 and 3 debt groups and non-debt capital banks.

The Moderate Debt Profile

The result of the MANOVA, in Table 7, shows there is a statistically different profile for banks containing moderate levels of debt capital compared to those with all equity. To examine how these profiles differ an analysis of the step-down F and mean values are required. Table 8 presents the combined means for analysis. Table 15 gives the F-ratios. In examining the step-down F, it is seen that the variables contributing the greatest overall significance are V_1--operating income to total assets; V_8--short term debt to total capital; and V_{10}--total capital to risk assets. All three variables have large F-ratios with significant levels exceeding the .05 critical level.

The examination of the means (Table 8) develops more insight into those variables. Banks with all equity have superior returns as a percent of assets (V_1: .9% to .66%). It is not unexpected, as discussed previously, for non-debt banks to have superior returns on assets. The addition of interest bearing long term debt capital will, ceteris paribus, decrease NCOI. The amount of difference, of about a third, is relatively large. Reviewing all levels of debt-non-debt it is seen that Level 2 banks clearly have the lowest NCOI/asset ratio.

Further examination of Table 8 also shows that the Level 2 banks have lower total capital to risk assets (V_{10}: 9.6% to 10.21%); and lower short term debt to total capital (V_8: 106.5% to 128.6%). The remaining variables show no significance via the step-down F ratios. Can an explanation of the above differences be suggested?

The answer suggested is that Level 2 debt banks, by the use of long term debt capital, increased their total capital base relative to all equity banks. In addition, since the long term debt created financial leverage and the corresponding risk of fixed interest charges, Level 2 banks reduced their reliance on short term borrowings relative to equity banks. The result, it is suggested, gives Level 2 banks a greater total capital position and a smaller short term debt position. Whether the actions described above by Level 1 banks is behavioral (i.e., desire lower risk because of increased long term leverage); or due to managements' belief that additional funds, via short term borrowings, were not needed is left to the concluding chapter.

For those banks not employing debt capital, what does the profile of Level 2 banks show?[1] The analysis appeared mixed. As it relates to "long term" leverage, they are correct--leverage can work both ways. Higher fixed interest costs reduced earnings available to stockholders, but as has been pointed out, the non-debt banks were also levered but in a different sense; their technique was to keep the maturity short term in nature. As it relates to concerns of safety, image, and public responsibility, the analysis is incomplete. It would appear that, given a choice, short term debt is riskier than long term. The pressure to roll short term debt over and the threat of default "closer" due to the short (less than a year) maturity schedule creates greater market and liquidity risk for non-debt capital banks. The longer maturity of debt capital may lend greater stability to debt banks.

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[1]A summary of these views is expressed in Chapter III.

Variables used to differentiate the effects on stock market price (P/E ratio, V_7) and various asset mix indicators (loans/assets, V_3; and loans/deposits, V_4) show no significant differences. The overall operations appear identical.

The High Debt Profile

The MANOVA analysis (Table 7) of banks with high levels (3) of debt capital when contrasted to banks with no debt capital showed significant debt effect. An examination of the variables (Table 16) indicated the following six contributed the greatest to the profile: V_1--NCOI to total assets; V_2--NCOI to owner's equity; V_4--total loans to total deposits; V_5--dividend payout; V_8--short term debt to total capital; and V_{10}--total capital to risk assets.[1]

Again, as expected, the NCOI to assets ratio is significant and favors non-debt capital banks. The leverage effect of debt capital (V_2) is, for the first time, clearly apparent with Level 3 banks having an average return on equity almost 10% greater than non-debt capital banks. In asset makeup the loan to deposit ratio (V_4) indicates that Level 3 banks contain a larger portion of loans to deposits. One interpretation of Variable 4 would be that it indicates an aggressive "reach" for yields; while another view could be that it is a result of a lack of

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[1]The following figures are summarized from Tables 8 and 17.

	Level 3 Banks		Non-Debt Banks
Variable	Significance	Mean	Mean
V_1	.0006	.74%	.90%
V_2	.0001	13.58%	12.49%
V_4	.0289	68.68%	66.02%
V_5	.0316	43.17%	41.11%
V_8	.0001	94.56%	128.60%
V_{10}	.0001	10.39%	10.21%

sufficient deposit growth relative to loan demands. To obtain a better grasp on those views concerning risk and growth, the remaining variables require analysis.

The payout ratio, or percent of earnings paid in cash dividends (V_5), for debt capital banks is significantly higher. As previously described, prior studies tend to show that high payouts are correlated with higher market price of common stock.[1] In this sample the market price variable (V_7), shown by the price/earnings ratio (P/E) indicates no differences between banks. The means, for example, as shown in Table 8, are almost identical (11.39x to 11.38x). The market appears, for the period observed and sample studied, to disregard the expected stronger stock prices from those banks having higher dividend payouts. It would also be expected that a firm earning superior returns on shareholders' equity would hold a relatively higher P/E ratio. This is not the situation in the sample examined and the P/E ratios are identical.

A possible explanation for those observations may center on the risk perceptions of investors. The increase in risk by the addition of both debt capital[2] and an observed higher loan to deposit ratio could be discounted by a lower P/E than would be expected given superior

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[1]See Chapter IV for details of these studies particularly by David Durand and E. F. Drzycimski.

[2]The question of risk from a leverage view typically centers on the quality of stability (variance) of the earnings stream. The view held is that the income stream of debt institutions will fluctuate greater than non-debt streams. A major study on this point by S. D. Magen on the fifty largest U.S. banks on data from 1962 through 1964 held that long term debt's fixed charges did not ". . . cause variations in the net operating earnings beyond those experienced before the deduction of interest and taxes." He felt that his test disproved the theory that introduction of debt ruins the quality of

returns on equity and higher dividend payout. Further examination of this risk question centers on the evaluation of V_8 and V_{10}--short term debt/capital and total capital/risk assets. They both indicate that significant differences exist with debt banks appearing to have less risk. From a total capital view (equity plus long term subordinated debt) debt banks have a stronger capital base which would indicate a reduction in risk. In addition, since the short term debt position (V_8--Table 8) is almost 30% greater in non-debt banks, debt capital banks in Level 3 would appear to have an even smaller risk profile. Both variables, V_8 and V_{10}, would tend to offset the risk added to debt capital banks by a greater loan to deposit ratio and the presence of long term debt. Unfortunately, the total effects of the variables on the question of risk are impossible to quantify in this study. It is not possible to add or subtract the risk factors indicated by the significant differences shown and described above.

Summary

The profile of all levels of debt banks relative to banks containing 100% equity funds suggests the following. The addition of debt capital does not automatically create observable financial leverage. In banks containing low debt concentrations no positive

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earnings. Although his research appears sound, it is impossible to dismiss the fact that the chance for fluctuations in earnings are greater for a levered stream of income. What he showed, in the period examined, was although the probability was higher the actual fluctuation was low. It should also be noted that the period he examined was really in the debt issuing period and concentrations of debt were not large, hence his results are expected. See Magen, "Cost of Capital and Dividend Policies in Commercial Banks," Journal of Finance and Quantitative Analysis, vol. VI, no. 2 (March, 1971), p. 746.

effect was seen. As debt increased, though, financial leverage appears and for high debt levels (3) appears evident in earnings. The debt issues also supplemented deposits, the traditional source of funds, because of the apparent lower deposit growth (or base) originally experienced by debt capital banks relative to the all equity banks in the study. Another factor in the decision to issue debt may have been the perception by management of interest rate increases therefore making long term debt instruments relatively cheap. This behavioral perception does not fit Level 1 banks but appears to directly fit Level 3 banks. The issuing of the issues also created a stronger total capital base and, hence, a lower risk posture relative to risk assets for debt capital banks.

On the question of stock market price individual variables do not indicate, by what could be called traditional expectations, the impact of debt capital. The strongest view may well be taken from the indifference of the market. The P/E ratios in both debt capital and non-debt capital banks appears the same. If the P/E ratio is accepted as a measure of relative risk it appears the market is indifferent. That view would be consistent with Wade's study[1] and may indicate that when all possible variables are examined the market perceives big banks as being "equal" and "safe."[2] This view has empirical support from a

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[1]Wade, Senior Capital . . .

[2]The bias of big-strong-safe may have been seriously weakened with the failure of three, billion plus banks since 1973 (U.S. National; Franklin National; and Security National Bank.) During the period of this study the history of large banks' financial strength appeared unblemished.

corporate view[1] and with Federal deposit insurance gathers support from the individual consumer.

The concluding chapter will further explore the results of the MANOVA design. Possible behavioral views will be presented and developed along with other reasons for the results shown in the research.

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[1]Staats, "Corporate Treasurers View Bank Capital."

TABLE 11

STEP-DOWN MULTIPLE CORRELATION ANALYSIS CONTRASTING LEVEL 1 DEBT BANKS AND NON-DEBT BANKS FOR 1971

Variables	Univariate F	Step-Down F	Significance
V_1	2.8442	2.8442	.0955
V_2	.0566	2.4490	.1215
V_3	.9119	.9505	.3325
V_4	.7044	.9438	.8348
V_5	.0450	.1475	.7020
V_6	.7269	.8211	.3677
V_7	.0064	.0129	.9098
V_8	.4954	.4063	.5258
V_9	.0003	.5151	.4752
V_{10}	.1936	.2318	.6316
V_{11}	1.1196	.3466	.5579
V_{12}	2.1840	.7817	.3796

TABLE 12

STEP-DOWN MULTIPLE CORRELATION ANALYSIS CONTRASTING LEVEL 2 DEBT BANKS AND NON-DEBT BANKS FOR 1971

Variables	Univariate F	Step-Down F	Significance
V_1	11.8867	11.8867	.0009
V_2	2.1214	.5808	.4482
V_3	.0243	.0029	.9569
V_4	.0870	.0400	.8420
V_5	2.7577	1.6540	.2022
V_6	1.2310	.0543	.8163
V_7	.0012	.1058	.7459
V_8	.1785	4.4808	.0376
V_9	1.2787	.0432	.8360
V_{10}	.6211	2.1254	.1491
V_{11}	.0006	.0916	.7630
V_{12}	.3041	1.0591	.3069

TABLE 13

STEP-DOWN MULTIPLE CORRELATION ANALYSIS CONTRASTING LEVEL 3 DEBT BANKS AND NON-DEBT BANKS FOR 1971

Variables	Univariate F	Step-Down F	Significance
V_1	6.4546	6.4546	.0130
V_2	3.0721	15.9721	.0002
V_3	.0631	.0001	.9937
V_4	.9587	.7588	.3863
V_5	.5766	2.6901	.1050
V_6	.0190	.1783	.6740
V_7	.2756	.1805	.6721
V_8	1.9782	34.4162	.0001
V_9	1.0862	.9958	.3215
V_{10}	.0786	2.7859	.0993
V_{11}	1.3256	.1340	.7155
V_{12}	1.8827	.0394	.8249

TABLE 14

STEP-DOWN MULTIPLE CORRELATION ANALYSIS, AFTER REORDERING, CONTRASTING LEVEL 1 DEBT BANKS AND NON-DEBT BANKS FOR BOTH TIME PERIODS

Variable	Step-Down F	Significance
V_1	5.4652	.0206
V_2	4.8978	.0283
V_8	.1469	.7020
V_{12}	1.2328	.2685
V_{11}	.0454	.8316
V_9	.3297	.5667
V_4	2.3192	.1298
V_5	.3342	.5641
V_7	.0551	.8148
V_{10}	5.8067	.0172
V_3	.0783	.7800
V_6	.0178	.8941

TABLE 15

STEP-DOWN MULTIPLE CORRELATION ANALYSIS, AFTER REORDERING, CONTRASTING LEVEL 2 DEBT BANKS AND NON-DEBT BANKS FOR BOTH TIME PERIODS

Variable	Step-Down F	Significance
V_1	22.8404	.0001
V_2	1.4442	.2312
V_8	5.0088	.0266
V_{12}	.6421	.4242
V_{11}	.5270	.4690
V_9	.2407	.6244
V_4	.6188	.4327
V_5	2.3148	.1302
V_7	1.2404	.2671
V_{10}	15.2043	.0002
V_3	.5675	.4524
V_6	.3793	.5389

TABLE 16

STEP-DOWN MULTIPLE CORRELATION ANALYSIS, AFTER REORDERING, CONTRASTING LEVEL 3 DEBT BANKS AND NON-DEBT BANKS FOR BOTH TIME PERIODS

Variable	Step-Down F	Significance
V_1	12.4025	.0006
V_2	30.9800	.0001
V_8	21.3744	.0001
V_{12}	.1960	.6586
V_{11}	.0009	.9759
V_9	.0332	.8557
V_4	4.8607	.0289
V_5	4.7028	.0316
V_7	1.9206	.1678
V_{10}	120.2476	.0001
V_3	.1276	.5439
V_6	1.2727	.2610

CHAPTER VII

SUMMARY, CONCLUSIONS AND RECOMMENDATIONS FOR FUTURE RESEARCH

Summary

The use of debt capital has become an important practice in the commercial banking industry. It has given large banks an additional degree of flexibility during a period of high growth. Debt capital has grown from less than 22 million dollars and .1% of total capital in 1962 to approximately 7% of capital totaling over 4 billion dollars by the year ending 1972.[1] However, to believe that acceptance of debt capital is unanimous is a mistake. Differences of opinion concerning the value of debt capital continue to be voiced particularly as it relates to the function of capital and the adequacy of capital. Unfortunately, the different views as to the value and impact of senior debt capital continue to suffer from a common deficiency, lack of evidence. The two latest empirical studies by Julian Wade and Kalman Cohen tend to support the issuance of debt capital.[2] On a theoretical level Pringle's work develops the view of optimality of the capital structure but on the question of the specific impact of debt capital he is relatively silent. He explicitly builds into his model the opportunities to utilize long

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[1]FDIC, Annual Report-1972, p. 251; FDIC, Bank Operating Statistics-1972, Table B; and Irving Trust Company, Report on Securities . . . (April 30, 1974), p. 2.

[2]Wade, Senior Capital . . .; and Cohen, "Dynamic Balance Sheet Management . . ."

term debt capital where it is advantageous to maximize the shareholders' wealth position.[1] He leaves it to others to develop the details of the debt capital decision. Pringle's work can be thought of as continuing the belief that banks should have the flexibility to compete for capital and to adjust their capital structures to optimize shareholders' wealth just as does any other corporation.[2]

This study examined the impact of debt capital on selected financial characteristics of large commercial banks via a multivariate analysis of variance (MANOVA) covering 12 variables for the period 1971 and 1972. The variables were eight ratios and four indexes. The 88 banks studied were divided into four classifications by levels of debt in their capital structure: low level (1) contained less than 15% debt/total capital; medium level (2) contained 15 to 30% debt/total capital; and high level (3) contained greater than 30% debt/total capital. The remaining level contained no debt capital.

The primary purpose was to compare the financial characteristics of the two types of bank, debt or non-debt, as shown by selected ratios and indexes so as to answer the basic question: is there a difference in the financial profiles of banks which utilize debt capital? From that point an analysis of observed differences was done to develop or explain those differences. The analysis is confronted with the problem of separating the impact of the debt capital decision from ancillary asset management decisions that are faced and made by managers which

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[1]Pringle, The Role of Capital . . .

[2]This is the position taken by Citicorp which some observers take as being the view of the industry. See George Vojta, Bank Capital Adequacy.

have timing impacts and other implications.

Conclusions

The results obtained from this study can be stated as follows:

1. Where the amount of debt capital is "high" as a proportion of total capital in banks, for the firms observed, favorable financial leverage is observed. Return on stockholders' equity is higher.
2. Higher long term debt capital increases the total capital of debt banks and significantly improves the traditional total capital to risk asset ratio.
3. Stock prices show an indifference between banks containing debt capital and those containing all equity.
4. Where long term bank debt is "high," short term debt is significantly "low."

Stronger conclusions are difficult to state. The analysis is mixed. Different levels of debt generate different financial characteristic profiles. To be complete, though, some of the observed differences in the financial characteristics need to be presented. One may speculate about some possible sources of observed differences: forecasting of interest rates and behavioral attitudes of bank management.

In periods of prospective rising interest rates and continued asset growth, banks have a natural bias (or temptation) toward issuing debt capital. The opportunity to stabilize a source of funds at an after-tax cost that appears to be relatively inexpensive in comparison to other sources of funds can be attractive to bank management.[1]

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[1]Kalman Cohen, "Dynamic Balance Sheet Management . . ." p. 17.

Financial theory would argue that the decision concerning the capital makeup for an individual bank must be made on the basis of its contribution to the maximization of stockholders' wealth.[1] Bank management would then be expected to look to the expected reaction of the market (investors) when debt is injected into the capital structure. Critics believe the debt will add to the risk of the firm and that the risk will be perceived by investors resulting in unfavorable effects on the stock price (i.e., change in the capitalization rate of the firm).[2]

The effect on bank earnings is relatively straightforward if it is assumed that the firm can reemploy its borrowed funds at a rate greater than the cost of the debt. If the return is greater there will be an increase in the earnings stream available to shareholders. Given this forecasted positive leverage the debt capital question branches in two directions: will the change in the capital structure alter the capitalization rate that stockholders will apply to the future stream of earnings; and what dividend policy will be followed in disbursing the increased stream of earnings. The dividend decision also adds an area of conflict; greater dividends (particularly in banks) are correlated to higher stock prices,[3] but if retained income can be utilized to generate superior returns traditional theory states that dividend payout should be decreased.[4]

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[1]James C. Van Horne, Financial Management and Policy, 3rd ed. Englewood Cliffs: Prentice-Hall, Inc., 1974), pp. 219-243.

[2]See Chapter III for detailed view of critics.

[3]David Durand, Bank Stock Prices . . .

[4]To be precise, traditional theory states that when the return on investment, r, is greater than the cost of capital, k, we would retain earnings. This policy treats dividends as a "passive residual" in the

In addition, due to the nature of regulatory controls, commercial banks have the opportunity to obtain structural leverage. The structural leverage effect means that capital increases (either debt or equity capital) provide a base for support of new deposits. If an individual institution is unable to develop additional deposits or it cannot develop profitable investments for its funds, structural leverage has little impact. If debt capital is used it may even result in a negative earnings effect if investment opportunities are marginally not as profitable as the cost of new capital. Therefore, a bank reviewing the debt capital decision must evaluate the effect of debt on earnings and on the capitalization of those earnings while simultaneously forecasting the effect of dividend policies.

A very practical problem in the debt decision is an estimation of future bank capital needs and market rates of interest. The interest rate forecast is critical. The effect of the timing on interest rates (the date when debt was sold) is observed in this study. For example, examining a basic variable, the cost of money specifically measured by the market rate of interest, develops some insight into the timing question.

Table 17 gives selected money market and bond rates for the period

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sense that it is based on the view that dividend policy is only a financing decision. The traditional view (as opposed to Modigliani and Miller's view that dividends are irrelevant) believes that the dividend policy is more than just a decision based on investment opportunities and it does affect the value of common stock. The result of this view would imply some payout even if a firm had many investment opportunities. In the situation in this research traditional theory would not support a greater payout given those debt banks having greater return and investment opportunities. See Solomon, The Theory of Financial Management, pp. 139-40; and Van Horne, Financial Management . . ., pp. 263-278.

1964 through 1972. It is clear that depending on the timing of the issue (the period in which it was sold) interest costs would be very different. For example, many banks in Level 2 did not add debt capital until 1969-70. The result of that decision was to be locked into a coupon near 8%. Banks who had not borrowed long term and who continued to roll their borrowings over received short term rates closer to 5-6% during 1971 and 1972. For Level 3 banks, the difference was that most banks had issued long term debt in the 1965-67 period. The result was to lock in a rate near 5%. In addition, the longer the debt capital is outstanding the greater the effect of structural leverage. The result of favorable timing of debt capital sales and structural leverage clearly had a major impact on banks with high levels of debt capital.[1]

Managements' forecast of interest rates directly affects the debt capital decision. On the other hand, what if banks had no choice in the decision? If a bank's deposit growth, its traditional source of funds, is not sufficient for its needs, debt issues may be a logical alternative even if interest rates are forecasted to be high. Level 3 banks may have been in that position. They had a loan to deposit ratio greater than non-debt capital banks. Since the loan and deposit growth variables (V_{11} and V_{12}) were alike for the period observed the belief that debt banks started with smaller deposit basis has some merit. The result would be debt banks needing to supplement their sources of funds via long term bond sales rather than rely on deposits.

Another aspect of bank managements' decision, as previously mentioned, is the bank's cost of capital. This study indicates that the

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[1]Kalman Cohen, "Dynamic Balance Sheet Management . . ."

TABLE 17

AVERAGE MARKET RATES OF INTEREST
FOR THE PERIOD 1964 THROUGH 1972
(Percent per annum)

Period	Prime Commercial Paper	Federal Funds	U.S. Sec. 3-5 Yrs.	Aaa Utilities	Aaa Corporate
1964	3.97	3.50	4.06	4.53	4.40
1965	4.38	4.07	4.22	4.60	4.49
1966	5.55	5.11	5.16	5.36	5.13
1967	5.10	4.22	5.07	5.81	5.51
1968	5.90	5.66	5.59	6.49	6.18
1969	7.83	8.22	6.85	7.71	7.03
1970	7.72	7.17	7.37	8.68	8.04
1971	5.11	4.66	5.77	7.62	7.39
1972	4.69	4.44	5.85	7.31	7.21

SOURCE: Federal Reserve Bulletin, Financial and Business Statistics (October, 1969 and February, 1974), pp. A33 and A34.

market places almost identical value on banks, as shown by their price/earnings ratio, no matter what their capital structure. There is no significant difference between price/earnings ratios of banks containing debt capital (no matter what level) and those banks containing all equity capital. This result is consistent with Wade's study for the five year period ending 1965.[1] This result is interpreted as being in agreement with the traditional approach to the cost of capital, and at least for the period under observation and for the amount of debt involved, stockholders do not perceive significant risk differentials between banks with debt capital and those without debt capital.[2]

It is also possible that investors in analyzing the risk inherent in a particular bank review the total debt position of the bank. The investor would find from this study and the banks sampled that banks with no long term debt capital have slightly larger equity positions but also have larger short term debt positions. It is quite possible

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[1]Wade, Senior Capital . . .

[2]An indirect example of this view can be shown by restructuring the traditional dividend model (if r and b are held constant) to read $P/E = \frac{1-b}{k-br}$, where b is earnings retention rate, k is cost of equity capital, and r is the rate of return on owners equity. The formula can be further restated to: $k = E/P(1-b) + br$. In this research we have the P/E ratio (and $E/P = \frac{1}{P/E}$), b and r. Therefore, using Table 8 data obtained from Chapter VI for example purposes we find that for Level 3 debt banks $k = \frac{1}{11.39}$ (1-.568) + (.568 x .1358) or 11.6% and for non-debt banks $k = \frac{1}{11.38}$ (1-.589) + (.589 x .1249) or 11.0%. Although no statistical inference can be read from this example, the use of the mean data for the period does tend to show little difference between the banks' cost of equity capital, k. The difference observed is as expected with slightly higher capitalization rate for debt banks, but the difference is small.

investors perceive this short term debt as having equal (or more) risk than the long term debt and, therefore, believe they have a Hobson's choice relating to risk and are indifferent.

This research suggests that the concerns voiced by opponents of debt capital have only modest strength. Their concern over increased risk (and eventual insolvency) has centered only on the long term debt capital issue resulting in a fog over the crucial question, which is the effect of all non-deposit debt. As banks have increased their long term debt (Level 1 to Level 3), their short term debt positions relative to all equity capital banks clearly declines. The large short term debt position shown by all equity banks may create many of the concerns opponents of debt capital have stated.

As this study implies, the timing decision of any debt issue is crucial when costs associated with changes in market rates of interest are so large. On the average, the banks utilizing large amounts of debt capital appear to benefit from a favorable interest rate structure (i.e., probably from earlier issues) as well as the relatively large amount of financial leverage. The joint effect, it appears, increased returns on equity significantly.

Another point for debt capital banks, particularly banks with large debt capital positions, concerns the multipurpose features built into bank debt capital. The flow of funds from the issues can be directly used for commercial loans which carry high returns and competitive implications.[1] In addition, the debt capital expands the capital

[1]For instance, in a period of monetary or loan tightness the ability to "make" a loan carries with it a large competitive edge in gathering (holding) commercial customers.

base (and lending limits) thereby jointly increasing another competitive point and satisfies supervisory agencies' desire for more capital base.[1]

The last observation drawn from this research relates to the theoretical position of the role of capital. That question is heatedly debated.[2] The managerial position of structural optimality, although difficult to define precisely, has consensus as to being possible and desirable. This study suggests that the banking profession is equally as divided on the question of optimal structure, and some of the different views are represented in the samples used in this research. Specifically, banks utilizing extensive debt capital (Level 3), for the period under observation, paid out significantly higher amounts of earnings than non-debt capital banks. It is suggested that this observed decision may imply that these banks are reaching for a perceived optimal capital structure which includes the possibility of even greater long term financial leverage.

Recommendation for Future Research

Future areas requiring examination include: continued work in the area of the cost of capital; the question of low deposit growth and the debt decision; and the role of non-deposit debt management in commercial banks. The latter area appears highlighted by this research. An examination of the debt management decision would include, it seems,

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[1]Silverberg, "Bank Debenture Financing . . .," pp. 46-48 and p. 51.

[2]See Pringle, The Role of Capital . . . for a bank model and Van Horne, Financial Management and Policy, pp. 219-245 for the detailed corporate views.

an analysis of the supervisory constraint (i.e., capital adequacy); risk considerations for varying maturities of debt issues; and market (depositors' and investors') perception of risks associated with debt policies particularly in light of large bank failures since 1973.

APPENDIX A

APPENDIX A

DEFINITIONS OF TERMS USED IN VARIABLES

1. Average total assets. The unweighted average gross assets for the year (computed by Investors Management Services, Inc. [IMS]).

2. Average total deposits. The unweighted average calculated by adding beginning and ending balance for the year of world-wide deposits and dividing by 2.0.

3. Average total loans. The unweighted average gross loans for the year including Federal funds sold and securities purchased under agreements to resell (calculated by IMS).

4. Average total capital. The unweighted average of total capital funds computed by adding beginning and ending of year total long term debt (as classified by regulatory officials); and total owners' equity position (including issued stocks, surplus and all related reserves) and dividing by 2.0.

   A. Debt Capital: as described above, but using only long term debt.

   B. Equity Capital: as described above, but using only owners' equity.

5. Dividends paid. The total charges to capital accounts for the cash dividends declared on the bank's common stock for the year.

6. Risk assets. The average total assets minus cash and U.S. Government securities.

7. Net current operating earnings. The total net operating earnings of the bank after deducting:

   A. Current operating expenses
   B. Interest expense
   C. Income taxes

   and before deducting or adjustment for:

   A. Minority interest
   B. Preferred dividends
   C. Profit or Loss on securities sold or redeemed
   D. Extraordinary items

8. Average short term borrowing. The unweighted average calculated by adding beginning and ending years total of the bank's total borrowings (excluding capital notes and debentures and mortgage indebtedness) and dividing by 2.0.

9. Average price per share. The unweighted average of the high and low price for the year divided by 2.0 on market transactions fully adjusted for stock splits and stock dividends during the year.

SOURCE: Section 9, Bank Compustat Manual.

APPENDIX B

APPENDIX B

LEGAL STATUS OF SENIOR CAPITAL ISSUES UNDER STATE BANKING LAWS EFFECTIVE IN 1966

State	Permitted	General Limitations	Convertibles Permitted	Included in Lending Limits: Lease to Any one Borrower	Included in Lending Limits: Other Loans or Investments	Included in Capital Adequacy Appraisal
Alabama						
Alaska	Yes[a]	Only as a matter of supervisory discretion; no statutory provision.		No	None	No
Arizona	Yes		Yes	Yes	b,g	Yes
Arkansas	Yes	May not be sold at less than par; not to exceed total of capital and one-half of certified surplus.		No		
California	Yes		Yes	No	None	No
Colorado	Yes	Two times capital and surplus. May be issues to increase lending limits.	No	Yes	b,c,d,e,f	Yes
Connecticut	Yes		Yes	No	None	Yes
Delaware	Yes		Yes	Yes	c,d	Yes
Florida	Yes		Yes	Yes	b,c,d,e,f	Yes
Georgia	Yes	Not to exceed 50% of capital and unimpaired surplus.	Yes	No	None	No
Hawaii	Yes	Amounts raised contingent on condition of bank.	Yes	No	None	No
Idaho	Yes	Not to exceed unimpaired paid-in capital plus 50% of unimpaired surplus.				

APPENDIX B

State	Permitted	General Limitations	Convertibles Permitted	Included in Lending Limits: Lease to Any one Borrower	Included in Lending Limits: Other Loans or Investments	Included in Capital Adequacy Appraisal
Illinois	No	Law is silent on capital notes and debentures. Supervisor does not object to issuance of long-term debt, but such borrowings are not considered as part of capital.				
Indiana	Yes	Purpose to create sound capital; must be subordinate to deposits.	Yes	Yes	b,c,d,e,f	Yes
Iowa	No					
Kansas	Yes	Not to exceed paid-in capital stock plus 50% of unimpaired surplus.	Yes			
Kentucky	Yes			No		
Louisiana	No	Notes are considered "borrowed money" and not as part of capital.				
Maine	Yes		Yes			
Maryland	Yes		Yes	Yes	b,c,d,e,f	Yes
Massachusetts	Yes		Yes			Yes
Michigan	Yes		Yes	Yes	c,d	
Minnesota	Yes		No	No	None	Yes
Mississippi	Yes	Considered as "borrowed money" not a part of capital.				No
Missouri	Yes	May not be sold at less than par; may not have more than 20-year maturity.	Yes	No	None	Yes

APPENDIX B

State	Permitted	General Limitations	Convertibles Permitted	Included in Lending Limits: Lease to Any one Borrower	Included in Lending Limits: Other Loans or Investments	Included in Capital Adequacy Appraisal
Montana	Yes[a]	Issued only to a Federal or quasi-Federal agency and then only under special regulations of that agency and the Superintendent of Banks.		Yes	c,d	Yes
Nebraska	Yes[a]		No	No	None	No
Nevada	Yes		Yes	No	None	No
New Hampshire	Yes		Yes	No	None	Yes
New Jersey	Yes	Not to exceed 50% of bank's "capital funds"; 25-year maturity.	Yes	No	None	Yes
New Mexico	Yes	Not to exceed unimpaired paid-in capital stock and 50% of unimpaired surplus.	Yes	Yes		
New York	Yes	No statutory limitations; each case handled by Superintendent on ad hoc basis.	Yes	Yes	c,e,f	Yes
North Carolina	No	Banks may issue subordinated notes but such borrowings are not considered part of capital.	Yes	No	None	No
North Dakota	Yes	May be used as capital when sold to RFC.				Yes (as stated)
Ohio	Yes		Yes	Yes	b,c,e,f	No
Oklahoma	Yes	Not to exceed paid-in capital stock plus 50% of unimpaired surplus.	Yes	No	e	No
Oregon	Yes		Yes	No	None	No
Pennsylvania	Yes	Not to exceed capital plus 50% of surplus.				Yes

APPENDIX B

State	Permitted	General Limitations	Convertibles Permitted	Included in Lending Limits: Lease to Any one Borrower	Included in Lending Limits: Other Loans or Investments	Included in Capital Adequacy Appraisal
Rhode Island	Yes	Not to exceed capital stock plus 50% of surplus.		Yes		Yes
South Carolina	Yes		Yes	Yes	b,c,d,e,f	Yes
South Dakota	Yes		Yes	No	None	No
Tennessee	Yes		Yes	Yes		
Texas	Yes	Amount limited to capital and surplus.	No	No	None	Yes
Utah	Yes	Amount limited to 33 1/3% of capital and surplus.	No	Yes	b,c,d,e,f	Yes
Vermont	Yes		Yes			Yes
Virginia	Yes		Yes	Yes*	b*,c*,d*,e*,f*	Yes*
Washington	Yes		Yes	Yes	b,c,d,e,f	Yes**
West Virginia	Yes		Yes	No	None	Yes
Wisconsin	Yes[a]	Common capital must at least equal amount of debenture.	No	Yes	b,c,d,e,f	Yes
Wyoming	Yes	Not to exceed 50% of capital stock and surplus fund.	Yes	No	None	No

a - In emergency conditions only.
b - Loans to affiliates.
c - Purchases of investment securities.
d - Investments in bank premises.
e - Loans on stock or bond collateral.
f - Bankers' acceptances.
g - Other - Computation of reserves.

*Only if notes are convertible to capital stock.
**Assuming requirements to refund or replace with common capital upon retirement.

NOTE: Blank spaces indicate no known statutory provision.

SOURCE: Use of Senior Capital by Commercial Banks, Bank Management Committee, American Bankers Association, New York: 1967, pp. 73-78.

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