A MULTIVARIATE ANALYSIS
USING FINANCIAL RATIOS
FOR THE LEBANESE COMMERCIAL
BANKS IN 1990

BY

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Research Topic Presented in Partial Fullfillment

of the Requirements for the Degree

Master of Science in Business Management

Business Division

Beirut University College

August, 1992

BEIRUT UNIVERSITY COLLEGE

P.O. BOX 403 / 13-5053

BEIRUT , LEBANON

APPROVAL OF RESEARCH TOPIC

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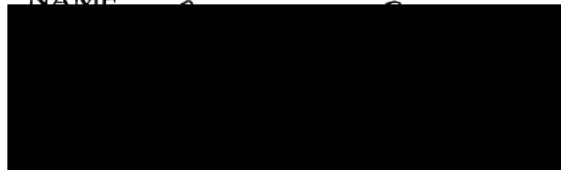
DEGREE   MASTER OF SCIENCE IN BUSINESS MANAGEMENT

TITLE OF RESEARCH A MULTIVARIATE ANALYSIS USING FINANCIAL RATIOS FOR THE LEBANESE COMMERCIAL BANKS IN 1990.

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ACKNOWLEDGEMENT.

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CHAPTER I
INTRODUCTION

General Background

Analysis of the Lebanese commercial banks' financial position is perhaps more critical now than ever before. The financial news is full with a record of bank bankruptcies. In addition, the political unrest and economic crisis in Lebanon caused the operations and financial policies of the Lebanese commercial banks to be managed and analyzed with a very sharp pencil. There is no room for mistakes.

Bankruptcy prediction models have been presented in the academic journals since the 1930s. However, until the research of William H. Beaver (1968) and Edward I. Altman (1968), these models did not gain much credibility in the business community.

Beaver simply examined the differences in ratios between failed and non failed firms. He concluded that certain financial ratios differed significantly between the two categories[1] .

Altman's research is possibly the most widely quoted, employed, and commonly used as a statistical technique in the field of bankruptcy studies, namely, discriminant analysis[2].

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[1] - William H. Beaver, "Market Prices, Financial Ratios, and the Predictions of Failure", Journal of Accounting Research, (Autumn, 1968), 179-192.

[2] - Edward I. Altman, "Financial Ratios, Discriminant Analysis and the Prediction of Corporate Bankruptcy", Journal of Finance, (September, 1968), 559-609.

With literally hundreds of ratios to calculate and consider, it is no wonder that many analysts have difficulty in choosing which are most appropriate. Chen and Shimerda (1981) examined this problem using factor analysis and came up with a way to group ratios into categories that contain basically the same information[3] .

Financial models readily available due to improvements in microcomputer hardware and software in 1980s represent significant advances over earlier models. These improvements enable the decision maker to analyze the financial implications of alternative strategies by using an extremely useful analytical tool, i.e, the financial ratio analysis.

Financial ratios play an important role in the operations of organizations. The need for using quantitative methods in decision making led managers to give more emphasis on financial ratios.

A ratio is a simple mathematical expression of the relationship of one item to another. It "focuses attention on a relationship which is significant, but a full interpretation of the ratio usually requires further investigation of the underlying data"[4] . Ratios are not a substitute for sound thinking and "the purpose of using ratios in financial statement analysis is to reduce the amount of data to workable form and to make the data more meaningful"[5] .

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[3] - K.H. Chen and T.A. Shimerda, "An Emperical Analysis of Useful Financial Ratios", Financial Management, (January, 1981), 51-60.

[4] - Walter B. Meigs and Robert F. Meigs, Accounting: The Basis for Business Decisions, (McGraw-Hill Book Company, 1977), 792-793.

[5] - Jerry A. Viscione, Financial Analysis Principles and Procedures (Boston: Houghton Mifflin Company, 1977), 35.

In using ratios, financial analysts constantly search for some standard of comparison against which to judge whether the relationships that they have found are favourable or unfavourable. Two such standards are (1) the past performance of the company, and (2) the performance of other companies in the same industry.

For each individual business the question will be what ratios will emphasize trends in production or administration, measure functional activity, point to and measure reactions of one sphere of activity on another, assist in the observation of efficiency and waste, reveal strength or weakness, utilization or idleness, impose more checks, stimulate research and assist in scientific disclosure. Ratios being chosen to meet the needs of the individual business, will by no means always be comparable as between different businesses.

Relationships of figures must always be based on relationships in fact, and the closer the relationship in fact the better the ratio.

Ratios should moreover be as far as possible in sequence. "Ratios of primary figures should precede and prepare the ground for ratios of complex figures, which in turn will lead to composite ratios"[6] . However, in presentation, the opposite sequence will usually be followed in view of the greater importance of ultimate ratios. Thus, the first object will be to submit master ratios giving summarized information as conveniently as possible. Additional ratios will then give the desirable amount of detailed information under each heading.

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[6] - Bradbury B. Parkinson, <u>Accounting Ratios in Theory And Practice</u> (London: Gee And Company (Publishers) Limited, 1951), 16.

Successful ratio analysis is as dynamic as the business to which it is applied and the supreme skill in ratio work is not calculation or the drawing of legitimate conclusions, but appropriate choice and adaptation to give vital information, the need for which at the moment may be fully realized or completely ignored. However, such choice and adaptation means constant research since practice shows that the importance of individual ratios wanes and waxes. "A ratio vital for a decision this year may not be worth its preperation next year, and an unhealthy growth of useless ratios has already been referred to as possibly worse than complete disregard for ratio, for they may instil a sense of security that is entirely without justification"[7].

Financial ratios are prepared for or by proprietors, higher management, creditors and investment analyst; furthermore, they relate different balance sheet items, or balance sheet items with income statement items, or balance sheet items with current money rates or share values. The balance sheet is accordingly the main source of such ratios.

Ratio analysis is the most useful analytical review technique in banking because it: 1) is concise, 2) facilitates comparisons 3) is widespread in use, and 4) is frequently relied on by bank management. Examining financial relationships helps us identify problem areas. Ratio analysis is used by bank credit departments to analyze financial statements submitted by business firms seeking credit, and by bank investment departments to analyze data on securities. Bank regulatory agencies also make extensive use of ratio analysis.

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[7] - Ibid., 20.

Purpose and Need for the Study

The purpose of this study is to determine the predictive ability of the financial ratios in the Lebanese commercial banks. These banks have similar activities, characteristics, and problems because of the prevailing situation in Lebanon.

In 1975, before the war broke out, the banking sector played an effective and effectual role in the growth and progression of the Lebanese economy. Since war broke out and throughout eight years, Lebanon's banks proved their great ability to adapt with the changeable and unfixed situation owning to its internal and external strategies that they adopted[8]. This led to an increasing growth for these banks through the continuity of the crisis. After the year 1983, Lebanon's banks ability to hold out started to decrease and weaken. In 1990, i.e., after sixteen years of war, war's results affected banking sector as it affected other productive sectors. All factors of the economy were directly affected by the fighting that occured in each geographic area of the country. The banking sector also had its price to pay. Late 80s witnessed several bank failures as well as the existance, and for the first time, what has been called "problem banks" due to several factors of which the most important are:

- The first factor is represented in the accumulation of problems which led to a paralysis in production and a continuous tumbling of the Lebanese pound exchange compared to foreign currencies which led to a decrease in the volume of bank services.

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8 - Ahmad Saloum, "The Arab Banks in 1990", <u>Al Massaref Al Arabiya</u>, (November, 1991), 150-168.

- The second factor is a result of bad banking management caused by a lack of qualification which led to deceit, stealing, and making speculation to the native currency by penetrating the Code of Money and Credit and the rules of the Central Bank and Banking Control Commission; thus, being away from the sound banking basis.

- The third factor is a result of weaknesses in all kinds of banking supervision starting from the internal control through the external audit ending to a paralysis that caused the Banking Control Commission due to some vacancies in its hierarchy and the impossibility to be occupied under the political situation at that time. These problems continued to appear due to the bad security situation and the pressures resulted from the forces and parties that were dominating. In addition to these factors, there appeared a bank crisis caused by Al-Mashrik Bank at the end of 1988 which had some effects on other banks[9].

It is important to mention that some causes are related to an individual bank's daily operations and its management policies. A bank may incurr various types of risks while conducting daily operations; thus, affecting its financial position.

In view of these circumstances, this research focuses on the financial ratio analysis in the Lebanese banking sector which could help the management of the unsuccessful ones to adjust their position and the successful ones to strengthen their position by revising and reviewing their strategy in the light of this study.

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[9] - Ibid., 150-168.

This study aims at analysing data for all Lebanese commercial banks and indicating more sophisticated approaches to financial ratio analysis.

General Statement of the Problem

A re-form of the Lebanese economy and a search for a special situation to it in the new universal organization are considered as the principal challenges we are facing nowadays. The commercial banks are supposed to play an important role in this field taking into consideration its importance in going after to insure the internal and external resources to finance Lebanon's reconstruction operation. The old role performed by Lebanese banks before war intending to carry the Arab money to the international financial markets is over. The regional changes led to the appearance of financial centers instead of Beirut through the Lebanese war in all of Bahrein, Saudi Arabia, Cairo, and Oman. From here, Lebanese banks have to do a necessary rehabilitation program to face the local and international changes.

Lebanon stands today at a critical turning point of its modern history, and reconstruction constitutes one of its most important themes after sixteen years of war which proved politically, economically, and socially costly.

All the circumstances explained led the researcher to focus his study on the structure and strength of the Lebanese commercial banks.

The purpose of this study is to assess the quality of ratio analysis within a modern statistical analytical context. Specifically, 76 available financial statements are analyzed and the performance of the banking industry in Lebanon is predicted using a multivariate analysis. Many tools will be deployed to gather the data in the required format and to manipulate them using advanced statistical techniques through a comprehensive set of procedures. All these procedures are computed using computer softwares like Dbase III plus and advanced SPSS package.

Research Questions

This research attempts to answer the following questions:

1.   What are the major characteristics of the Lebanese banking sector?

2.   What are the major factors underlying the financial ratios in the Lebanese commercial banks?

3.   What is the best use of financial ratios that determine the strengths or weaknesses in the Lebanese commercial banks?

Definition of Terms

Several ratios can be derived from the items presented in a bank's Financial statements. Listed below are the definition of terms constituting the components of the financial ratios used in this research.

Assets: Are all properties that belong to the business. They could be classified as liquid assets, loans, investments, fixed assets, and other assets as follows:

1. Cash: It represents the cash in hand or in vault.

2. Liquid assets: It consists of cash in hand and readily available bank balances and other assets that can be easily and quickly converted into money as Lebanese treasury bills and deposits with banks and financial institutions.

3. Loans: It includes all types of loans such as short term loans, medium and long term loans, and debtor accounts against creditor accounts.

4. Investments: This category of assets includes all kinds of investments in shares, bonds, debentures, other security investments, and investments in subsidiaries and affiliates.

5. Fixed Assets: All tangible long term assets such as land, buildings, furniture, and equipments are included in this category.

6. Other Assets: Any unspecified asset not included in the above categories.

Liabilities and Shareholders' Equity: These consist of amounts owed by the bank to others. They also represent sources of funds used by the bank consisting of shareholders' funds or internal funds and external liabilities by which is meant external to shareholders' funds. Liabilities and shareholders' equity are subdivided into the following categories.

1. Deposits: Deposits consist of deposits obtained by the bank from individual customers, other banks, other organizations, and other agencies and certificates of deposits. Deposits may be classified as demand, saving, or time deposits.

2. Other Liabilities: Any external liability not classified under deposits.

3. Shareholders' Equity: It includes share capital, reserves, and retained earnings. It represents the funds belonging to the shareholders of the bank.

4. Share Capital: It consists of paid up share capital, share capital raised by rights-issues, and bonus share issues.

5. Reserves and Retained Earnings: It includes all types of statutory/legal, special/general reserves created out of the bank profits, and any undistributed/unallocated profits retained.

Risky Assets: The sum of investments, loans, and contra accounts that carry a high risk premium.

Earning Assets: All assets that generate profits.

Permanent Assets: The sum of investments and fixed assets.

Contra Accounts: These are not assets or liabilities of the bank in the strict sense as they represent direct obligations to customers in the theoretical sense. However, these items may represent potential obligations (liabilities) and equally potential returns (assets) if these obligations are not fully collateralised by the institution and are part of the customer's risk. They represent the off-balance sheet activity of the bank. Items such as engagements by signature received, real securities received, guarantees and endorsements, discounted bills circulating under the bank's endorsement, confirmed documentary credits, other engagements, and bank's assets given as guarantees are considered contra accounts.

Working Capital: It is the difference between shareholders' equity and permanent assets.

Free Capital: It is the difference between shareholders' equity and fixed assets.

Net Income: It is the net profit for the year.

Limitations of the Study

The data has been collected from "Bilan Banques" published annually by Bankdata Financial Service. Those statements sometimes do not reflect perfectly the true position of the banks. Another limitation is that all figures of the published financial statements are set in Lebanese currency and do not differentiate between domestic and foreign denominated balances. These published figures may not reflect the real value of the various accounts because of the wide fluctuations of the Lebanese currency during the year under consideration. On the other hand, the choice of the analyzed ratios was constructed by the way the financial statements are constructed.

CHAPTER II
REVIEW OF LITERATURE

One of the basic goals in all human activities is to succeed. The literature is filled with bankruptcy prediction models. Chen and Shimerda (1981) studied 26 published researches that used 65 ratios. Their goal was to find a representative subset of ratios that would convey roughly the same information concerning performance[10]. They classified ratios into one of seven categories as follows:

Return on Investment: It includes the following:

- Return on Equity

- Return on Assets

- Operating Assets / Total Assets

- Operating Profits / Sales

Capital Intensiveness: It includes the following:

- Current Assets / Total Assets

- Sales / Total Assets

- Sales / Worth

Inventory Intensiveness: It includes the following:

- Sales / Working Capital

- Current Assets / Sales

- Sales / Inventory

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[10] - K.H. Chen and T.A. Shimerda, 51-60.

Financial Leverage: It includes the following:

- Debt Ratio

- Debt / Worth

- Net Work / Total Assets

- Long Term Debts / Total Assets

Receivables Intensiveness: They consist of the following:

- Receivables / Inventory

- Sales / Receivables

Short-Term Liquidity: It consists of the following:

- Current Ratio

- Quick Ratio

Cash Position: It consists of the following:

- Cash / Sales

- Cash / Total Assets

- Cash / Current Assets

Most analytical researches done on failing firms use ratio analysis as their foundation. The descriptive literature identifies the causes of corporate failure to be:

    (1)   Internal factors

        1.   Bad management manifested through

            (a)   lack of responsiveness to change in technology

            (b)   bad communications

            (c)   misfeasance and fraud

(d)   insufficient consideration for cost factor

(research and development costs in particular)

(e)   poor knowledge of financial ratios

(f)   high leverage position - particularly harmful in an economic

downturn.

(2)   External factors

I .   Labor unions: Too high a wage settlement causing the firm to pay its

employees in excess of their marginal product.

II.   Government Regulations which impede, in some instances, the

market system distorting in the process its signals to the corporate

desicion makers.

III.   Natural causes: Natural disasters, demographic changes, etc.

The analytical studies on the general macroeconomic causes of corporate failure was begun by Altman. "Failure was significantly linked to the prevailing monetary policy (a tight monetary policy increasing the probability of failure), the investor's expectations about economic conditions (the more negative the expectations the more likely failures are to occur), and the state of the economy"[11].

On the micro Level, Altman found that the age of a firm has a significant impact on its chance of failure. The significant micro analysis; however, came with the usage of discriminant analysis applied to financial ratios in the prediction of corporate failure.

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[11] - Ismael G. Dambolena and Sarkis J. Khoury, "Ratio Stability and Corporate Failure", Journal of Finance 35, (September, 1980), 1019.

Beaver was among the first to use financial ratios to predict corporate failure. Using a paired sample analysis, with size and industry type used as bases for pairing, Beaver found overwhelming evidence of differences in ratios of failed and non-failed firms. To test the predictive power of ratios, Beaver used a dichotomous classification technique, and found the cash flow to total debt ratio to be the best predictor of failure five years preceding failure. The evidence indicates that the non-liquid asset measures predict failure better than the liquid asset measures, even in the years immediately before failure, the two less frequently advocated liquid asset measures outperform the two more frequently advocated ones, and failed firms tend to have lower, rather than higher inventory balances[12].

Altman improved on Beaver's univariate method of analysis by introducing the multivariate approach which allows for the simultaneous consideration of several variables in the prediction of failure. The approach is that of multiple discriminant analysis (MDA). The following discriminant function turned in the best performance:

$$Z = 0.012 \, Z1 + 0.014 \, X2 + 0.033 \, X3 + 0.006 \, X4 + 0.999 \, X5$$

Where

$X1$ = Working capital to total assets

$X2$ = Retained earnings to total assets

$X3$ = Earnings before interest and taxes to total assets

$X4$ = Market value of equity to book value of total debt

$X5$ = Sales to total asset

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[12] - William H. Beaver, "Financial Ratios as Predictors of Failure", The Accounting Review 14, (January, 1968), 113-121.

This model was able to predict accurately the bankruptcy up to two years prior to actual failure where the accuracy decreases after the second year[13].

These results were later shown by Moyer to be less suitable under conditions different from those used by Altman. Using paired sample analysis and step wise linear MDA on 23 pairs of large manufacturing, retailing, and railroads firms, Moyer found that a model with the first three parameters in Altman's model had explanatory power superior to Altman's[14]. Moyer's results were confirmed by Williams and Picconi using an original sample and a holdout sample.

In his most recent study, Altman, with a new data base adjusted to take into account the latest financial reporting standards, used MDA once again with both linear and quadratic structures. The study resulted in new variables explaining corporate failure.

These are:

(1) $X1$ = Return on Assets. Earnings before interest and taxes to total assets

(2) $X2$ = Stability of earnings. Measured by the "normalized measure of the standard error of estimate around a ten-year trend in $X1$".

(3) $X3$ = Debt service. Earnings before interest and taxes to total interest payments.

(4) $X4$ = Cumulative profitability. Retained earnings to total assets.

(5) $X5$ = Liquidity. Current assets to current liabilities.

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[13] - Edward I. Altman, 589-609.

[14] - R.C. Moyer, "Forecasting Financial Failure: Reexamination", Financial Management (Spring, 1977), 113-156.

(6)   X6 = Capitalization. Equity to total capital.

(7)   X7 = Size measured by the firm's total assets.

Altman's latest model predicted better than his earlier model. The newer Zeta model is far more accurate in bankruptcy classification in years 2-5 with the initial year's accuracy about equal. The older model showed slightly more accurate non-bankruptcy classification in the two years when direct comparison is possible. The classification accuracy of bankrupt firms five years before failure was 69.8 percent using the Zeta analysis and 36 percent using the 1968 model[15].

While Altman's work, especially his latest, addresses marginally the question of ratio stability, the treatment is far from adequate. "It is the stability of every ratio overtime that is relevant and not just that of earnings"[16]. Wide and increasing downward shifts in the current ratio, for instance, can spell disaster for a firm particularly one with a high leverage ratio.

Dambolena and Khoury present in their study another model on corporate failure that uses financial ratios and discriminant analysis as its core. The essential attribute of their model is its use of the stability of all financial ratios overtime, as well as the level of these ratios, as explanatory variables in the derivation of a discriminant function. Their research indicated a substantial degree of instability measured by:

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[15] - Ismael G. Dambolena and Sarkis J. Khoury, 1017-1027.

[16] - Ibid., 1020.

(1)   The standard deviation of the financial ratios over the past few years,

(2)   their standard error of estimate, and

(3)   their coefficient of variation, in the ratios of firms that went bankrupt when

        compared with those that did not.

This instability showed a significant increase overtime as the corporation approached failure.

The inclusion of the stability of ratios in the analysis improved considerably the ability of the discriminant function to predict failure[17] . Their model classified firms into failed and non-failed groups with 78 percent accuracy five years prior to failure.

The strength of their analysis lies not only in the superior predictive power of the model, but in the improvement in the conceptual framework of models for predicting corporate bankruptcy.

The standard deviation of ratios overtime appears to be the strongest measure of ratio stability which is the essence and the promise of the analysis.

Nadim Abdallah Tohme prepared a recent study which provided financial analysis for the GCC commercial banks in 1988. The purpose of his study was to assess the quality of ratio analysis within a modern statistical analytical context[18] . Specifically, 45 available financial

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[17] - Dambolena and Khoury, 1017-1025.

[18] - Nadim Abdallah Tohme, A Multivariate Analysis of the GCC Commercial Banks, (Beirut, 1990), 1-84.

statements were analyzed and the performance of banking industry in the Gulf area was predicted using multivariate analysis. Tohme specified a large number of ratios when studying the structure and performance of Gulf banks. Some of the ratios used in our study are extracted from Tohme's study. His research illustrated the major factors underlying these ratios, exposed existing differences, and classified them into four seperate groups using cluster analysis. Finally, the multiple discriminant function was applied as a predictive technique using group membership as a dependent variable and factor scores as independent variables.

The major factors underlying the financial ratios in the banking industry for the Gulf area could be summarized as follows:

1. Capital intensiveness

2. Risk attitude

3. Profitability

4. Off-balance sheet activity

The cluster analysis identified four different groups with the following characteristics:

Group one:

a. Middle to high capital intensiveness

b. High risk attitude (low liquidity and high investments)

c. High profitability

d. Middle to high off-balance sheet activity.

Group two:

    a.   Low to middle capital intensiveness

    b.   Middle to high risk attitude

    c.   Low profitability

    d.   Low off-balance sheet activity

Group three:

    a.   Low capital intensiveness

    b.   Low risk attitude

    c.   Low to middle profitability

    d.   High off-balance sheet activity

Group four:

    a.   High capital intensiveness

    b.   Low to middle risk attitude

    c.   Middle to high profitability

    d.   Low to middle off-balance sheet activity

Using the multiple discriminant function to separate the groups, three functions were identified, namely:

    a.   The first function represents the off-balance sheet activity.

    b.   The second function represents capital intensiveness.

    c.   The third function is made up of risk attitude and profitability.

Simon Naemy (1990) in his research, examined to identify those unique characteristics of problem banks and quantified the variables which were likely to be effective indicators as predictors of bank failure[19]. He used a multivariate statistical model to investigate the usefulness of certain financial ratios in predicting bank failure. The model used relied on quantitative rather than qualitative analysis and has been applied on all Lebanese banks having data from the period of 1983 to 1988. The banks that were excluded are specialized banks and all exit banks of the period under consideration. Five ratios have been chosen as predictors of bank failures.

These ratios are:

1) **Liquidity risk** $= X1 = $ **(Savings + Checking + Current + Fixed Deposits + Banks)**
$$\text{(Cash with Banks + Securities)}$$

The higher this ratio, the higher will be the liquidity risk of an individual bank, and the less the coverage of its liabilities other things being equal.

2) **Credit risk** $= X2 = $ **(Advances + Bills + Total Contra Accounts - Provisions)**
$$\textbf{Total Assets}$$

This represents the risk that borrowers will not repay their loans as promised.

3) **Capital risk** $= X3 = $ **(Total Assets + Total Contra Accounts)**
$$\text{(Profit carried forward + Reserves + Capital)}$$

This ratio refers to the possibility that a bank may become insolvent.

4) **Efficiency** $= X4 = $ **General Expenses**
$$\textbf{Total Assets}$$

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[19] - Simon Naemy, <u>Bank Failures: Causes and Preventions</u>, (Beirut, 1990), 64-70.

This ratio reflects the spending of a bank as a percentage of total assets. Other things being equal, the higher this ratio the less efficient could be a bank in its operation, and the more the likelihood of failure.

5) **Profitability = X5 =**
$$\frac{\text{Interest and Commission + Income from Securities}}{\text{Total Assets}} - \frac{\text{Interest on Deposits+ Interest on Debenture Loans}}{\text{Total Assets}}$$

The higher the ratio, the better is the bank financial position and the less its likelihood of failure.

In interpreting the data, this ratio was reversed to become: $\frac{\text{Total assets}}{\text{Net revenue}}$

Each bank has its Z score, and the higher the Z score for an individual bank, the worst is its financial condition.

Adjusted Z score was used, so that each ratio would have an average close or equal to one.

A cut off point was established and it is the point that separates the two categories of banks. This cut off point is set at the Z score of 1.2. It is then concluded that all banks having a Z score above 1.2 will be considered as problem banks while others with Z score below 1.2 are the healthy banks. Of course there is going to be some type I and type II errors, however, the most important is that the results came out to be statistically significant.

CHAPTER III
PROCEDURES AND METHODOLOGY

This chapter is concerned with the procedures and methodology used in this study. It consists of the population selected, the selected variables, and their measurements and the conceptual framework for analysing the data.

Population Selected

All Lebanese commercial banks whose financial statements are analyzed in the 1991 edition of Bankdata will be used as the population of this study. These banks are listed below in alphabetical order.

- Adcom Bank S.A.L.

- Al-Mawarid Bank S.A.L.

- Al-Moughtareb Bank S.A.L.

- Algemene Bank Nederland N.V.

- Allied Business Bank S.A.L.

- American Express Bank L.T.D.

- Arab African International Bank

- Arab Bank P.L.C.

- Banco di Roma

- Bank Al-Madina S.A.L.

- Bank of Beirut and the Arab Countries S.A.L.

- Bank of Beirut S.A.L.

- Bank of Credit Commerce International S.A.L.

- Bank of Kuwait and the Arab World S.A.L.

- Bank of Lebanon and Kuwait S.A.L.

- Bank Saderat Iran

- Banque Audi S.A.L.

- Banque Beyrouth Pour Le Commerce S.A.L.

- Banque de Credit National S.A.L.

- Banque de l'Essor Economique Libanais S.A.L.

- Banque de l'Industrie et du Travail S.A.L.

- Banque de la Bekaa S.A.L.

- Banque de la Mediterranee S.A.L.

- Banque du Credit Populaire S.A.L.

- Banque du Liban et d'Outre-Mer S.A.L.

- Banque J. Geagea S.A.L.

- Banque Joseph Lati et Fils S.A.L.

- Banque Libanaise Pour le Commerce S.A.L.

- Banque Libano - Bresilienne S.A.L.

- Banque Libano - Francaise S.A.L.

- Banque Misr Liban S.A.L.

- Banque Nationale de Paris "Intercontinentale"

- Banque Pharaon et Chiha S.A.L.

- Banque Saradar S.A.L.

- Banque Tohme S.A.L.

- Beirut Riyad Bank S.A.L.

- British Bank of the Middle East (The)

- Byblos Bank S.A.L.

- Capital Trust Bank S.A.L.

- Commercial Facilities Bank S.A.L.

- Credit Bancaire S.A.L.

- Credit Commercial du Moyen-Orient S.A.L.

- Credit Libanais S.A.L.

- Federal Bank of Lebanon S.A.L.

- First Phoenician Bank S.A.L.

- Foreign Trade Bank S.A.L.

- Fransabank S.A.L.

- Future Bank S.A.L.

- Globe Bank S.A.L.

- Habib Bank Limited

- Infibank S.A.L.

- Intercontinental Bank of Lebanon S.A.L.

- Jammal Trust Bank S.A.L.

- Jordan National Bank S.A.L.

- Lebanese Canadian Bank S.A.L.

- Lebanese Swiss Bank S.A.L.

- Lebanon and Gulf Bank S.A.L.

- Litex Bank S.A.L.

- Metropolitan Bank S.A.L.

- Near East Commercial Bank S.A.L.

- North African Commercial Bank S.A.L.

- Orient Credit Bank S.A.L.

- Rafidain Bank

- Rifbank S.A.L.

- Saudi Lebanese Bank S.A.L.

- Saudi National Commercial Bank

- Societe Generale Libano-Europeenne de Banque S.A.L.

- Societe Bancaire du Liban S.A.L.

- Societe Nouvelle de la Banque de Syrie et du Liban S.A.L.

- Syrian Lebanese Commercial Bank S.A.L. (The)

- Transorient Bank S.A.L.

- Unibank S.A.L.

- United Bank of Lebanon and Pakistan S.A.L.

- Universal Bank of Saudi and Lebanon S.A.L.

- Universal Bank S.A.L.

- Wedge Bank Middle East S.A.L.

Each of these 76 banks is represented by a Balance Sheet and Contra Accounts and Profit and Loss Account.

An understanding of how the financial statements are constructed is necessary to evaluate the financial ratios used.

Specialized banks are excluded from this study. These banks are:

- Banque de Financement S.A.L.

- Banque de l'Habitat S.A.L.

- Investment and Finance Bank

- The National Bank for Industrial and Touristic Development S.A.L.

The Selected Variables and their Measurements

For banking data, the "Bilan Banques" published annually by Bankdata Financial Services have been used [20] . This research used financial ratios that could be extracted from the available source data. These ratios generally fall into the following categories:

Liquidity Ratios: The liquidity of a bank is measured by the degree to which it can meet its short-term obligations. It implies the ability to convert assets into cash or to obtain cash immediately. Liquidity is protection against the risk that losses may develop if banks are forced to sell or liquidate creditworthy assets in an adverse market. Ratios used in this study to measure liquidity are:

1. **Liquid Assets**
    Total Deposits

2. $$\frac{\text{Liquid Assets}}{\text{Total Deposits} + \text{Guarantees and Endorsements}}$$

20 - Freddie C. Baz, <u>Bilan Banques: Financial Statements Analyzed</u>, (Beirut: Bankdata Financial Services, S.A.R.L., 1991).

Liquid assets are:

Assets		Liabilities and shareholders' equity
Cash and central bank		Central bank
+ Lebanese treasury bills		+ Banks and financial institutions
+ Banks and financial institutions	{-}	+ Head office and branches, parent
+ Head office and branches, parent		company and foreign sister financial
company and foreign sister financial		institutions and subsidiaries
institutions and subsidiaries		

Capital Adequacy Ratios: A proper definition of capital adequacy would be the one that related capital to risky assets and to liabilities subject to withdrawals. The capital of a bank should be adequate in relation to the character and condition of its assets, its deposit liabilities, and other corporate responsibilities. There are four important measurements of bank capital ratios. These ratios have been used as indicators of a bank's soundness and determine a bank's financial position. These measurements are:

1. $$\frac{\textbf{Equity}}{\textbf{Total Liabilities}}$$

2. $$\frac{\textbf{Equity}}{\textbf{Risky Assets}}$$

3. $$\frac{\textbf{Equity}}{\textbf{Loans + Contra Accounts}}$$

4. $$\frac{\textbf{Equity}}{\textbf{Fixed Assets}}$$

Equity includes share capital, reserves and premiums, balance carried forward, net income (or loss) for the year, and subordinated borrowings and debenture loans. Risky assets include investments, loans, and contra accounts.

Asset Quality Ratios: There are certain ratios that determine the quality of assets. One of these ratios is:

1. $\dfrac{\text{Provisions for Doubtful Debts}}{\text{Total Loans}}$ or $\dfrac{\text{Loan losses}}{\text{Total Loans}}$

Earning Ratios: The higher the earning ratios of a bank the better is its financial position and the lesser its likelihood of failure. The Earning ratios used in our research are:

1. $\dfrac{\text{Net Income}}{\text{Total Assets}}$

2. $\dfrac{\text{Net Income}}{\text{Equity}}$

3. $\dfrac{\text{Net Income}}{\text{Earning Assets}}$

4. $\dfrac{\text{Net Income}}{\text{Paid Capital}}$

5. $\dfrac{\text{Operating Income - Operating Expenses}}{\text{Total Assets}}$

Earning assets include Lebanese Treasury bills, banks and financial institutions, head office and branches, parent company and foreign sister financial institutions and subsidiaries, commercial bills discounted, loans to customers, bank acceptances, marketable securities, and miscellaneous debtor accounts.

Credit Risk Ratios: It is the risk that borrowers will not repay their loans as promised. Three important ratios could be used.

1. $$\frac{\text{Advances + Bills + Total Contra Accounts - Provisions}}{\text{Total Assets}}$$

2. $$\frac{\text{Loans}}{\text{Total Deposits}}$$

3. $$\frac{\text{Loans + Investments}}{\text{Total Deposits}}$$

Efficiency Ratios: These ratios show the extent to which a bank is conducting its operations within frontiers, two ratios are used:

1. $$\frac{\text{General Expenses}}{\text{Total Assets}}$$

2. $$\frac{\text{General Expenses}}{\text{Total Expenses}}$$

Operating Ratios: The most important operating ratios are:

1. $$\frac{\text{Total Loans without Guarantees}}{\text{Equity}}$$

2. $$\frac{\text{Loan loss Provisions}}{\text{Operating Income}}$$

3. $$\frac{\text{Working Capital}}{\text{Assets other than Permanent}}$$

Working Capital = [Equity - (Investments + Fixed Assets)]

Permanent Assets = (Investments + Fixed Assets)

Conceptual Framework for Analysing the Data

- Descriptive statistics in terms of frequency and percentage will be used to describe the characteristics of the 76 Lebanese commercial banks selected for this study.

-      Factor analysis will be used to determine the variables (dimensions) underlying the financial ratios.

The results and findings of this study are explained in the following chapter entitled findings of the study.

CHAPTER IV

FINDINGS OF THE STUDY

This chapter presents the findings of the research questions that were formulated in chapter I. These questions are:

1. What are the major characteristics of the Lebanese banking sector?

2. what are the major factors underlying the financial ratios in The Lebanese commercial banks?

3. What is the best use of financial ratios that determine the strengths and weaknesses of the Lebanese commercial banks.

The findings of the study which is conducted using cross sectional data for one year are presented and discussed in three major sections. The first section describes the major characteristics of the selected group of the Lebanese commercial banks. The second section describes the appropriate transformation of the financial ratios computed. The third section presents the factor analysis of financial ratios.

Major Characteristics of the Selected Sample.

The banks were broken into three categories based on the criteria used in evaluating the financial ratios of the commercial banks. These criteria are used by the Banking Control Commission as follows:

- Considering liquidity, the researcher used two ratios:

1. **Liquid Assets**
    Total Deposits

2. $$\frac{\text{Liquid Assets}}{\text{Total Deposits + Guarantees and Endorsements}}$$

Those ratios indicate the ability of a bank to pay all its obligations out of its short term assets or liquid assets.

As for the first ratio, those banks who had a ratio ranging from 0.48 to 0.55 are considered as banks with average liquidity, those who had a ratio higher than 0.55 are considered as banks with good liquidity, and below 0.48 are considered poor in liquidity.

As for the second ratio, the average liquidity ranges from 0.58 to 0.65, higher than 0.65 good liquidity, and below 0.58 poor liquidity.

- Concerning capital adequacy ratios, four ratios are used:

1. $$\frac{\text{Equity}}{\text{Total Liabilities}}$$

2. $$\frac{\text{Equity}}{\text{Risky Assets}}$$

3. $$\frac{\text{Equity}}{\text{Loans + Contra Accounts}}$$

4. $$\frac{\text{Equity}}{\text{Fixed Assets.}}$$

As for the first ratio, the primary function of the value of equity capital is considered to be the protection of depositors. In general, a bank's equity capital risk is reduced by the control of the regulatory authorities in charge and the bank's reserves. Those banks who had a ratio ranging from 0.05 to 0.12 are considered to be normally financed, from 0.13 to 0.21 are more conservative, and more than 0.21 are highly financed by shareholder's equity funds.

As for the second ratio, it is important to relate equity to risky assets because a measure of capital adequacy ratio indicates the extent to which a bank's capital can absorb loss and still

protect the interest of depositors. This ratio shows how much of risky assets are financed through capital or equity. On the average, a rate ranging from 0.07 to 0.09 was recommended, but it depends on what the risky assets includes.

Pertaining to the third ratio, it could be interpreted as the amount of equity capital retained for the loans given and potential benefits outside the balance sheet of the bank. A ratio ranging from 0.05 to 0.11 is considered as an average ratio, between 0.12 and 0.17 is considered above average ratio, and more than that means a high ratio with respect to equity to loans and conta accounts implying the bank has a conservative policy.

Applying the fourth ratio of capital adeqacy, article 153 of Money and Credit specifies the maximum percentage of this ratio which is 25%. Therefore, banks with ratios ranging from 0.22 and 0.25 are maintaining average ratios in this area, those who have more than 0.25 are poor, and those with ratios less than 0.22 could be considered good.

- One asset quality ratio is used. This ratio is:

Provisions for Doubtful Debts.
Total Loans

Whether the provisions taken are adequate is an important and complex question that requires analysis of the history of charge - offs, recoveries, "nonperforming" loans, the level of the loan loss allowance itself, and other factors relating to the growth and mix of loans. The details required for a reliable adequacy analysis of this kind are formidable. However, a bank with a high ratio of provisions to total loans is a conservative one.

- Regarding earnings, five raios are used in this study:

1.   **Net Income**
        Total Assets

2.   **Net Income**
         Equity

3.   **Net Income**
        Earning Assets

4. <u>Net Income</u>.
    Paid Capital

5. <u>Operating Income - Operating Expenses</u>.
    Total Assets

The first ratio, net income to total assets, is used to assess how much net profit is generated from the internal and external funds invested in the bank. The higher this ratio is the higher is the profitability which in the final analysis attests to management's success in running the bank. Banks with ratios raning from 0.00 to 0.010 are considered poor in performance, between 0.011 to 0.03 are considered as banks with normal ratio, and greater than 0.03 are considered above normal ratio.

The second ratio, net income to shareholders' equity shows how much net profit has been produced from the internal funds invested. The higher this ratio is, the higher the profitability is, and the better the policy of investment is. A more interesting approach is the gross profits to equity ratio, but since the data was not available for the gross profits, it has been replaced by net income to equity ratio. Ratios ranging from 0.00 to 0.100 imply poor performance, from 0.101 to 0.160 mean that banks have done well, and above 0.161 mean good performance.

The third ratio, net income to earning assets, shows how much net income is generated from the earning assets. A ratio ranging from 0.00 to 0.03 is considered poor, between 0.04 and 0.08 is a normal ratio, and above is considered good.

The fourth earning ratio, net income to paid capital, could be considered poor if a bank has a ratio ranging from 0.00 to 0.12, normal if it has a ratio ranging from 0.13 to 0.18, and good if it is higher than 0.18.

The fifth ratio is the margin between interest and commission received from clients; banks and financial institutions; and from treasury bills and the interest and commission paid divided by total assets. This ratio is called the spread. The minimum acceptable percentage for

this ratio is 3%. Banks with ratios ranging from 0.03 to 0.07 have an average performance in their operations; those with ratios higher than 0.07 have good performance, and below 0.03 are poor in their performance.

- Three important ratios are used to determine the credit risk of the Lebanese commercial banks. These ratios are:

1. $$\frac{\text{Advances + Bills + Total Contra Accounts - Provisions}}{\text{Total Assets}}$$

2. $$\frac{\text{Loans}}{\text{Total Deposits}}$$

3. $$\frac{\text{Loans + Investments}}{\text{Total Deposits}}$$

As for the first ratio, the lower this ratio is the safer the bank is. According to Banking Control Commission, the maximum acceptable percentage of this ratio is 55%. A low ratio of 19% to 38% of banks' assets invested in net loans, bills, and contra accounts indicates a low exposure by banks to a loan portfolio; it does not say anything about the degree of riskiness of this portfolio. In other words, this ratio does not expose the banks attitude towards risk which in the final analysis depends on the type of loans and their individual riskiness.

The different types of loans known in the United States can be summarized as follows:

1. Federal funds sold and repurchased agreements.

2. Real estate loans.

3. Loans to financial institutions.

4. Loans for purchasing or carrying securities (high risk)

5. Agricultural loans.

6. Commercial and industrial loans.

7. Consumer isntallment loans.

8. Personal loans.

Not all these types of loans are available in Lebanon; in addition, there is no detailed data to classify the bank's loans portfolio according to risk.

Generally speaking, all that can be said is that such ratio ranging from 0.19 to 0.39 means that the bank is very conservative, from 0.39 to 0.59 means that the bank has normal ratio, and higher than 0.59 means that the bank is very risky.

The second credit risk ratio, loans to total deposits, shows how much the bank is utilizing the deposits from clients in lending. A normal and average ratio depends on the management policy with respect to risk. The principle of a profit making activity of commercial banks is making loans to its customers. In the allocation of funds to the loan portfolio, the primary objective of the bank management is to earn income while serving the credit needs of its community.

Banks possessing loans to total deposits ranging from 0.29 to 0.49 are considered on the safe side, from 0.50 to 0.65 are considered normal in their policy, and above 0.65 means high ratio. It is important to mention that the Banking Control Commission limits the percentage of loans to total deposits in foreign currencies to 55%. However, our data is expressed in Lebanese pounds which is one of the limitations in this research.

As for the third ratio, loans plus investments to total deposits, it was recommended that a ratio ranging from 0.35 to 0.55 is a conservative ratio, from 0.56 to 0.75 is a normal one, and higher than 0.75 is a high ratio.

- The researcher employed two ratios in efficiency. Those ratios are:

1. $\dfrac{\text{General Expenses}}{\text{Total Assets}}$

2. $\dfrac{\text{General Expenses}}{\text{Total Expenses}}$

These two ratios are important to determine whether the bank is conducting its operations within frontiers. The lower are those ratios the better it is for the bank. An average ratio for general expenses to total assets range from 0.002 to 0.005 and from 0.02 to 0.05 for general expenses to total expenses.

- Regarding operating ratios, three of them are used. These ratios are:

1. $\dfrac{\text{Total Loans without Guarantees.}}{\text{Equity}}$

2. $\dfrac{\text{Loan loss Provisions.}}{\text{Operating Income}}$

3. $\dfrac{\text{Working Capital}}{\text{Assets other than Permanent}}$

The first ratio determines the amount of risky loans to equity. The lower is this ratio the better it is for the bank. Banks that maintain a ratio near to 0.00 are on the safe side and as the ratio increases the risk of the bank increases.

The ratio of loan loss provisions to operating income is the best single measure of the impact of loan loss upon earnings. The norm of this ratio is between 4% and 8% of operating income, though in high -loss banks the ratio can of course climb to lofty heights. It is important to keep in mind that banks with a low net interest margin have a diminished income cushion against which to shield a given amount of loss provision. Again, with this type of ratio we must be aware of potential misinterpretation due to the "rubber yardstick" problem.

As for working capital to assets other than permanent, an average ratio ranging between 0.01 and 0.02 is accepted.

Based on these standards, it was found that 27 out of 76 Lebanese commercial banks are in general poor, 37 out of 76 are on the average side, and 12 out of 76 are good banks in their performance. (Table I shows the results).

Table I

The value, frequency, percent, valid percent, and cum percent of Lebanese commerical banks

Value	Frequency	Percent	Valid Percent	Cum Percent
Good	12	15.8	15.8	15.8
Avarage	37	48.7	48.7	64.5
Poor	27	35.5	35.5	100.0
Total	76	100.0	100.0	

It is important to mention that 7 out of 27 banks classified in this study as poor in financial position were publicly declared as failed banks after 1990 (the analysis of this research is based on the financial statements of 1990). These banks are the following:

- Banque Libano - Bresilienne S.A.L.

- Foreign Trade Bank S.A.L.

- Capital Trust Bank S.A.L.

- Globe Bank S.A.L.

- Future Bank S.A.L.

- Banque Tohme S.A.L.

- United Bank of Lebanon and Pakistan S.A.L.

The remaining poor banks are considered as "problem banks"; however, the researcher could not mention them due to the banking secrecy law which is applied in Lebanon.

Assumptions of Normality and Homogeneity of Variance

The major problems encountered by this study can be expressed in two questions.

1. How many factors are there that underlie the financial ratios?

2. What are these factors?

To answer the first question, the financial ratios of the Lebanese commercial banks are factor analyzed and grouped into five major factors. To answer the second question, it is imperative to inspect the factor loading and name the factors.

It must be pointed out, however, that using the original data did not help in answering the questions. Few factor loadings were greater than 1.0. One plausible explanation is that the data is malfunctioning and factor analysis does not clean up bad data.

It was reasoned that in using cross-sectional data, the assumption of homoscedastic disturbance may be violated. Adjustments were used on the original data in order to improve them. Log, Sin, and Sqrt tranformation were applied to variables to deal with the skewness and kurtosis. Table (II) and table (III) show the mean, range, variance, skewness, and kurtosis for variables before and after transformation.

Table II

The mean, range, variance, skewness, and kurtosis of the financial ratios before the Log, Sin, and Sqrt transformation.

Ratios	Mean	Range	Variance	Skewness	Kurtosis
Liquid Assets / Total Deposits	.564	5.515	.363	-6.056	46.416
Liquid Assets / Total Deposits + Guarantees & Endorsements	.539	4.096	.237	-5.391	39.214
Equity / Total Liabilities	.030	.639	.006	6.632	50.083
Equity/Risky Assets	.103	1.667	.077	3.978	16.416
Equity / Loans + Contra Acc.	.113	2.069	.105	4.402	20.696
Equity/Fixed Assets	4.269	54.925	77.219	4.163	19.476
Provisions for Doubtful Debts / Total Loans	.238	.906	.046	1.163	.874
Net Income/Total Assets	.002	.041	.000	.903	3.930
Net Income / Equity	.116	11.964	1.930	-1.884	14.045
Net Income / Earning Assets	.002	.052	.000	1.076	5.652
Net Income/Paid Capital	2.611	119.130	180.614	7.844	65.087
Opert. Income - Opert. Exp. / Total Assets	.085	1.400	.033	6.176	40.548

Table II   Cont.

Ratios	Mean	Range	Variance	Skewness	Kurtosis
Advances + Bills + Total Contra Accounts - Prov. / Total Assets	.664	2.345	.200	1.463	3.782
Loans/Total Deposits	.528	5.448	.418	6.068	45.611
Loans + Investments/ Total Deposits	.541	5.466	.423	5.982	44.709
General Expenses / Total Assets	.015	.070	.000	1.975	4.547
General Expenses / Total Expenses	.099	.411	.004	1.570	5.152
Total Loans without Guarantees/Equity	114.136	5509.258	397690.716	8.257	70.257
Loan Loss Provisions / Operating Income	.289	10.900	1.559	8.404	72.209
Working Capital / Assets other than Permanent	.035	.463	.005	2.471	7.962

Table III

The mean, range, variance, skewness, and kurtosis of the financial ratios after the Log, Sin, and Sqrt transformation.

Ratios	Mean	Range	Variance	Skewness	Kurtosis
Liquid Assets / Total Deposits	- .244	1.081	.048	- .977	.598
Liquid Assets / Total Deposits + Guarantees & Endorsements	- .270	.940	.048	-1.015	.464
Equity / Total Liabilities	-1.912	2.989	.305	.251	.659
Equity/Risky Assets	-1.632	3.271	.481	.572	.633
Equity / Loans + Contra Acc.	-1.624	3.368	.491	.610	.739
Equity/Fixed Assets	.149	3.279	.486	- .206	- .036
Provisions for Doubtful Debts / Total Loans	.435	.951	.053	.075	- .421
Net Income/Total Assets	-4.787	5.877	4.113	.310	-1.615
Net Income / Equity	- .641	3.176	.699	- .600	- .064
Net Income / Earning Assets	-4.751	5.982	4.119	.310	-1.608
Net Income/Paid Capital	-2.273	7.437	4.334	.394	-1.351
Opert. Income - Opert. Exp. / Total Assets	-1.290	2.375	.124	1.212	4.630

Table III   Cont.

Ratios	Mean	Range	Variance	Skewness	Kurtosis
Advances + Bills + Total Contra Accounts - Prov. / Total Assets	.765	1.468	.080	- .068	.832
Loans/Total Deposits	.408	1.713	.076	- .638	2.895
Loans + Investments/ Total Deposits	.669	2.271	.095	1.925	10.499
General Expenses / Total Assets	.114	.263	.003	.516	1.059
General Expenses / Total Expenses	.301	.640	.012	- .028	1.093
Total Loans without Guarantees/Equity	1.341	4.097	.637	.370	.547
Loan Loss Provisions / Operating Income	.126	1.886	.047	- .640	11.698
Working Capital / Assets other than Permanent	-1.619	2.860	.283	- .255	1.164

By inspecting tables (II) and (III), it is evident that after the Log, Sin, and Sqrt transformation, the transformed variables have a better mean and variance. The measures of skewness and kurtosis became also better; therefore, twenty variables have been adopted for the study.

Factor Analysis of the Transformed
Financial Ratios

As a data reduction technique, factor analysis was used in this study to reduce the transformed financial ratios into five distinct factors. To control the number of factors to be extracted, it was decided to examine the proportion of variance accounted for jointly by the first (m) factors that will be used in oblique rotation. Factors with eigenvalues greater than 1.0 (table IV) were retained for the final rotation solution. This criterion ensured that only factors accounting for at least the amount of total variance of a single variable were treated as significant. (Table IV shows the eigenvalues and number of factors).

Table IV

Eigenvalues and Number of Factors

Ratios	Communality	Factor	Eigenvalue	Pct of Var	Cum Pct
Liquid Assets / Deposits	1.0	1	7.28630	36.4	36.4
Liquid Assets / Deposits + Guarantees	1.0	2	4.52858	22.6	59.1
Equity / Liabilities	1.0	3	3.53993	17.7	76.8
Equity / Risky Assets	1.0	4	1.49765	7.5	84.3
Equity/Loans + Contra Acc.	1.0	5	1.08102	5.4	89.7
Equity / Fixed Assets	1.0	6	.68620	3.4	93.1
Provisions for Doubtful Debts / Loans	1.0	7	.58188	2.9	96.0
Net Income / Assets	1.0	8	.37351	1.9	97.9
Net Income / Equity	1.0	9	.22131	1.1	99.0
Net Income/Earning Assets	1.0	10	.11956	.6	99.6
Net Income/Paid Capital	1.0	11	.05546	.3	99.9
Oper. Income - Oper. Exp./ Assets	1.0	12	.01787	.1	99.9
Advances + Bills + Contra Acc. - Prov. / Assets	1.0	13	.00593	.0	100.0
Loans / Deposits	1.0	14	.00482	.0	100.0
Loans + Investments / Deposits	1.0	15	.00000	.0	100.0
General Expenses / Assets	1.0	16	.00000	.0	100.0
General Expenses / Expenses	1.0	17	.00000	.0	100.0
Loans without Guarantees / Equity	1.0	18	.00000	.0	100.0
Loan loss Provisions / Oper. Income	1.0	19	-.00000	-.0	100.0
Working Capital / Assets Other than Permanent	1.0	20	-.00000	-.0	100.0

PC   Extracted   5   Factors

Note: The respective eigen value is the total amount of variance accounted for by a factor and equal to the sum of the square of the loadings in each column, taking into consideration that all the variables are normalized and the variance of each variable is 1. Thus the total variance for the 20 ratios in this study is 20 and the percentage of variable accounted for by a given factor (Pct of variance) is equal to eigen value/20.

Table (V) below reveals that there are five factors underlying the financial ratios. In asking what these factors are, this study has to search for an appropriate name for these factors. The financial ratios that loaded at least 0.70 with the rotated factor pattern were used to name the factors. (A loading of 0.70 was chosen since the square of this equals approximately 50% common variation shared between a given financial ratio and the respective factor).

Table (V) also shows that each financial ratio is highly loaded on one factor but not on the other and is used as a pure measure of the respective factor. It is important to note that it is argued sometimes that factor analysis throws a lot of variables together into a statistical machine and produces factors that have little meaning. It is argued that these factors are simply artifacts (average) of the method. This argument is basically irrelevant. No competent researcher would ever expect from factor analysis more than producing factors that have meaning.

Table V

Oblique Rotation Factor Solution

Ratios	Factor 1 Risk Attitude	Factor 2 Structural	Factor 3 Profitability & Performance	Factor 4 Efficiency	Factor 5 Operating
Loans + Investments / Deposits	**-.98243**	-0.3337	.20618	.01366	.10873
Loans / Deposits	**-.97571**	.01118	.12309	-.03104	.00870
Advances + Bills + Total Contra Acc. - Provisions / Total Assets	**-.96220**	-.09998	.12565	.14368	.10169
Liquid Assets / Deposits	**.91427**	.04991	.02530	-.00949	.09729
Liquid Assets / Deposits + Guarantees & Endorsements	**.90611**	-.00083	.05113	.01950	-.02893
Equity/Risky Assets	**.80614**	.54111	-.45799	-.04854	.15474
Equity / Loans + Contra Accounts	**.80317**	.54974	-.47230	-.06498	.17418
Working Capital / Assets other than Permanent	-.03383	**.90658**	-.13446	.10694	.36318
Equity/Liabilities	.02227	**.81244**	-.47434	.01483	.63235
Provisions for Doubtful Debts / Total Loans	.44594	**.69939**	-.13170	.44500	.27008
Equity/Fixed Assets	-.00134	**.66882**	-.40641	.44070	.41196

Table V   Cont.

Oblique Rotation Factor Solution

Ratios	Factor 1 Risk Attitude	Factor 2 Structural	Factor 3 Profitability & Performance	Factor 4 Efficiency	Factor 5 Operating
Net Income/Earning Assets	.11405	.50552	**-.92950**	-.17716	.32717
Net Income/Total Assets	.12340	.50422	**-.92408**	-.16229	.35056
Net Income/Equity	.07028	.03197	**-.90998**	-.29013	-.11083
Net Income / Paid Capital	.10390	.05333	**-.89349**	-.20273	-.17114
Total Loans without Guarantees/Equity	-.60846	-.40527	**.74413**	.08068	.06515
General Expenses / Total Assets	-.08365	.11979	.26714	**.96511**	.30116
General Expenses / Total Expenses	-.06663	.04289	.23432	**.96084**	.12179
Operating Income - Operating Expenses/ Total Assets	.05131	.45241	-.06193	.15124	**.93470**
Loan loss Provisions/Operating Income	.01516	.17810	.03165	.29546	**.91052**

CHAPTER V

SUMMARY AND CONCLUSION

Summary of the Answers to the Research

Questions

This research attempts to identify the major characteristics of the Lebanese commercial banks based on multivariate analysis of the financial ratios. It illustrates the major factors underlying these ratios, and specifies the best use of financial ratios that determine the strengths and weaknesses of the Lebanese commercial banks.

It was found that the major factors underlying the financial ratios in the Lebanese banking industry could be summarized as follows:

1.	Risk Attitude

2.	Structural

3.	Profitability and Performance

4.	Efficiency

5.	Operating

The financial ratios that determine the strengths and weaknesses of the Lebanese commercial banks regarding risk attitude are:

1.	$\dfrac{\text{Loans + Investments}}{\text{Deposits}}$

2.	$\dfrac{\text{Loans}}{\text{Deposits}}$

3.	$\dfrac{\text{Advances + Bills + Total Contra Accounts - Provisions}}{\text{Total Assets}}$

4. $\dfrac{\text{Liquid Assets}}{\text{Deposits}}$

5. $\dfrac{\text{Liquid Assets}}{\text{Deposits + Guarantees and Endorsements}}$

6. $\dfrac{\text{Equity}}{\text{Risky Assets}}$

7. $\dfrac{\text{Equity}}{\text{Loans + Contra Accounts}}$

The financial ratios that determine the strengths and weaknesses pertaining to structure

are:

1. $\dfrac{\text{Working Capital}}{\text{Assets other than Permanent}}$

2. $\dfrac{\text{Equity}}{\text{Liabilities}}$

3. $\dfrac{\text{Provisions for Doubtful Debts}}{\text{Total Loans}}$

4. $\dfrac{\text{Equity}}{\text{Fixed Assets}}$

As for profitability and performance the strengths and weaknesses are determined by the

following ratios:

1. $\dfrac{\text{Net Income}}{\text{Earning Assets}}$

2. $\dfrac{\text{Net Income}}{\text{Total Assets}}$

3. $\dfrac{\text{Net Income}}{\text{Equity}}$

4. $\dfrac{\text{Net Income}}{\text{Paid Capital}}$

5. $\dfrac{\text{Total Loans without Guarantees}}{\text{Equity}}$

Two ratios determine banks' efficiency. Those ratios are:

1. $$\frac{\text{General Expenses}}{\text{Total Assets}}$$

2. $$\frac{\text{General Expenses}}{\text{Total Expenses}}$$

Finally, operating strengths and weaknesses could be determined by the following two ratios:

1. $$\frac{\text{Operating Income - Operating Expenses}}{\text{Total Assets}}$$

2. $$\frac{\text{Loan loss Provisions}}{\text{Operating Income}}$$

From the results of factor analysis, it is clear that some assumptions regarding classification of the selected variables and their measurements stated in chapter III were misclassified. For example, the ratio of provisions for doubtful debts to total loans that was classified as an asset quality ratio before factor analysis is classified as a structural ratio after factor analysis. Moreover, the ratio of operating income less operating expenses to total assets was classified as an earning ratio while factor analysis classified it under operating ratios. Furthermore, liquidity ratio, credit risk ratios, and the ratios of equity to risky assets and equity to loans plus contra accounts are now classified in one category, risk attitude ratios, based on factor analysis. Also, equity to liabilities and equity to fixed assets were classified under capital adequacy ratios while factor analysis categorized them under structural ratios. Finally, factor analysis classified the ratio of working capital to assets other than permanent under structural ratios.

The major characteristics of the Lebanese commercial banks based on 20 significant variables used in this research implies that 15.8% (12 out of 76) commercial banks in Lebanon maintain good financial position, 48.7% (37 out of 76) have average financial position, and 35.5% (27 out of 76) have poor financial position.

Implications

This study concentrated on the classification of Lebanese commercial banks through the use of their financial ratios analysis as a basic instrument.

This study is meant to help bank managers and shareholders knowing the nature of the work done by the banks; it identifies and takes care of the weak points before becoming out of hand and the strong ones in order to develop them. Moreover, it aids in decision making specially concerning facilities with their pros and cons. It is worth noting that the different ratios that appear as priorities are the ones to identify the degree of riskness; therefore, it assists determining the future plan that should be followed. The ratio of general expenses to total assets and its relation to income aids management to take decisions either by increasing assets or decreasing expenses to improve income.

The above mentioned points refer to weak and average banks. With respect to above average banks, the results of this study help to either maintain the same level or improve it. Therefore, it serves the management of the unsuccessful banks to adjust their position and the successful ones to strengthen their position.

The importance of this research results were confirmed by the Banking Control Commission which interfere in banks to determine their financial position while concentrating on the important and master ratios concluded in this study.

Further studies are needed to be conducted on the relative importance, characteristics, and strength of each group and of individual banks within each group.

Recommendations

The scope of this research has been constrained by the limited availability of financial data. Accordingly, some useful ratios relating to Lebanese banks' financial activities had to be excluded. "Activity or Labor Productivity Ratios" were excluded due to the unavailability of the number of employees in each bank in order to calculate the total number of working hours spent in each bank. The availability of data for this item may have permitted the construction of another factor which may improve the study.

In addition, the study basically deals with the quantitative aspect of bank loans without emphasizing its qualitative implications. Whereas data limitations restrict the analysis to loan totals, future researches should ideally emphasize the qualitative aspects of the loan portfolio. Loans should be grouped into doubtful, secured, long term, and short term loans. Some important ratios could have been used if loans are subdivided into different categories.

A further data problem was the unavailability of foreign currencies deposits and loans which are very important in determining the ceiling of lending.

The statistical approach to financial ratio analysis used in this study could be extended to different financial institutions. Moreover, it is highly recommended that a study as the one done here be applied to international institutions.

This study of cross sectional analysis could also be used as a predictive tool for estimating banks structure, strength, characteristics, and activities by extending the study to a time series analysis to trace the evolution and development of banks.

This study recommends to require Lebanese banks to provide full disclosure of their banking activities, not only to improve the use of financial ratios as analytical tools, but also to encourage efficiency through competition based on sound information.

The availability of 76 commercial banks working in Lebanon at the time when the economic activities were marked down during war created an indigestion position in the banking sector. This pushed some banks to make operations that affected negatively the Lebanese economy. From this point, mergers of banks are important to strengthen the banking sector.

Also, the study recommends to emphasize the role of the Banking Control Commission giving it the right to inspect deposits at banks. Another recommendation is to give financial assistance to some safety banks that suffer from some difficulties. This should occur with the presence of tight control to make sure that such financial assistance is used in the right way.

Finally, the success to restore the role of Beirut as a financial center is related to three important points. The first point is the scope of success to rehabilitate the banking sector. The second point is related to the ability of Beirut to attract Lebanese and Arab capitals. The third point refers to Beirut's qualification to recycle these capitals in order to serve the national and regional economies.

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