A REPORT GENERATING LINEAR PROGRAMMING MODEL

FOR SCHEDULING THE ISSUANCE OF LARGE

CERTIFICATES OF DEPOSIT

By

WILBUR ORA HOWARD

Bachelor of Science
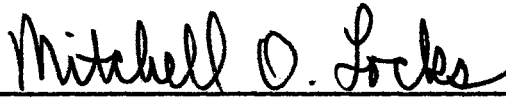
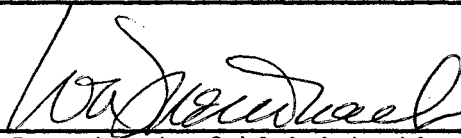Oklahoma State University

Stillwater, Oklahoma

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Report Approved:

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Report Adviser

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Name: Wilbur Ora Howard          Date of Degree: December, 1974

Institution: Oklahoma State University

Location: Stillwater, Oklahoma

Title of Study: A REPORT GENERATING LINEAR PROGRAMMING MODEL FOR
                SCHEDULING THE ISSUANCE OF LARGE CERTIFICATES OF
                DEPOSIT

Pages in Study: 64                 Candidate for Degree of Master
                                   of Business Administration

Major Field: Business Administration

Scope of Study: This study concerns a linear programming model which
     schedules the issuance of large ($100,000 or over) Certificates of
     Deposit (CD's) by a commercial bank. The objective of the study
     is to construct a model that will generate management reports
     based on the solution of the linear programming model. The solution
     of the linear programming problem represents a minimization of the
     total interest cost for all Certificates of Deposit to be issued
     during a 13-month period, based on an interest rate forecast supplied
     by the Chase Econometric Institute, subject to constraints which
     reflect management policy with respect to growth, turnover, and
     liquidity of the CD portfolio and the types of markets serviced by
     these instruments. The management reports prepared by the model
     are a summary of the linear program solution based on statistics
     of sales, outstanding amounts, and weighted average interest rates
     per type of instrument.

Findings and Conclusions: The model predicts an optimal CD sales
     schedule for thirteen months while minimizing the total interest
     cost of the sales over the planning period and generates four manage-
     ment reports based on the sales schedule predicted. However, the
     model involves only one type of liability of the bank and assumes
     certainty in predicting the CD sales schedule. The results of
     this study suggest that further research concerning the inclusion
     of risk constraints, more comprehensive management policy consid-
     erations, and economic considerations into the model is needed to
     make the model a more effective management decision making tool.

ADVISOR'S APPROVAL_____Mitchell O. Locks_____

PREFACE

This study is concerned with the modification of an existing Certificates of Deposit scheduling model of a commerical bank. The primary objective is to construct a model that will generate various management reports based on the solution of the linear programming model that minimizes the total cost of the issuance of the Certificates of Deposit over a thirteen-month period.

The author wishes to express his appreciation to his major advisor, Dr. Mitchell O. Locks, for his guidance and assistance throughout this study. Appreciation is also expressed to Mr. James Bruce of the Liberty National Bank in Oklahoma City, Oklahoma, for his assistance in the preparation of the relevant banking information used in this study.

A special note of thanks is given to Mr. Max McKee for his invaluable assistance in the preparation of the computer programs needed for this study. Additionally, appreciation is extended to Dr. Winfield P. Betty for his critique of the draft of the manuscript.

Finally, special gratitude is expressed to my wife, Connie, our daughters, Lori and Lisa, and our son, David, for their understanding, encouragement, and sacrifices during the preparation of this study.

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CHAPTER I

INTRODUCTION

This paper concerns a linear programming (LP) model which sched-
ules the issuance of large ($100,000 or over) Certificates of Deposit
(CD's) by a commercial bank.  The original version of this model,
which was prepared by Lester R. Harris [17] as an MBA Research Report
at Oklahoma State University, schedules CD's for the fixed 13-month
period June, 1974 to June, 1975, inclusive, using IBM's Mathematical
Programming System Extended (MPSX).  This paper reports on a modifi-
cation of that model which generates a management report by editing
and summarizing the LP output;  the model also has a "rolling" feature
which makes it possible to prepare this report for any consecutive 13-
month period, as well as, a graphical summarization of the output
which is prepared on a CALCOMP plotter.

The model is an application of an LP problem designed to minimize
an objective function subject to a number of constraining equations.
The solution is a set of variables, each variable representing the
amount of a type of CD issued during a particular month for a specified
maturity.  This solution represents a minimization of the total inter-
est cost for all CD's to be issued during the 13-month period, based
upon an interest rate forecast supplied by the Chase Econometric
Institute, subject to constraints which express management policy with
respect to growth, turnover, and liquidity of the CD portfolios, and
the types of markets serviced by these instruments.[1]

1

The management report prepared by the model is a summary of the LP solution based upon statistics of sales, outstanding amounts, and weighted average interest rates per type of instruments. There are three basic types of CD's, each representing a different market: local (type-0), national (type-6), and special (type-8).

In preparing this study, a feature of MPSX known as "READCOMM" [26] was used which enables the programmer to write a FORTRAN program to modify the LP output in any way which is convenient for his purposes. Variables are selected from the solution set of the LP program, temporarily stored, and used to provide the management report output.[2]

Lastly, recommendations and suggestions are provided concerning further improvements in the model.

# FOOTNOTES

[1]The interested reader should refer to Appendix A for the description and an abbreviated example of the LP model.

[2]See Appendix B for a description of the programs written for this model. Also, see references [25] and [26] for a description of the MPSX and READCOMM.

CHAPTER II

REVIEW OF THE LITERATURE

Introduction

A review of the current literature reveals a growing awareness of
the applicability of modeling techniques as an analytical tool to the
management of bank assets, liabilities, and investments.  The present
chapter discusses some early approaches to financial management and con-
cludes by discussing an inter-temporal, dynamic model for bond portfolio
management which provided some suggestions for improvement in the model
discussed by this report.

Portfolio Management

The Problem.  The essence of the management problem of portfolio
selection is the need to achieve a proper balance between income, ade-
quate liquidity to meet loan demand and deposit withdrawals, and the
risk of default when considering the total of a bank's financial posi-
tion.  Portfolio decisions made at any time directly affect a bank's
current, as well as future, income and profits.  Since the selection of
different alternatives invariably represent a trade-off between profits,
liquidity, and risk, the management is presented with a perplexing pro-
blem.  The evaluating and weighing of the factors involved in making the
decision between alternatives have caused managers to seek improved
approaches to portfolio management.

Early Approaches. Two basic approaches enumerated in the liter-
ature to provide an assist for bank management are the "pooled-funds"
approach and the "asset allocation" approach (see Broaddus, reference
[6]). Under the pooled-funds concept, bank management arbitrarily
defines a fixed liquidity standard and each dollar attracted is allo-
cated in identical proportion among its various categories of assets.
A major fault of this procedure is its failure to consider variations
in liquidity needs that arise from variations in the structure of
liability and loan accounts.

Another portfolio management technique is the asset allocation
approach. This technique recognizes the variations in liquidity needs
and allocates funds obtained from rapidly turned-over liabilities to
relatively short maturity assets, and vice versa. In Broaddus's
opinion the asset allocation approach is an improvement over the pooled-
funds approach, however, the technique possesses some fundamental weak-
nesses. First, turnover rate is a poor guide to liquidity requirements
since the turnover rate does not consider account stability, that is,
the net daily variation of an account's total balance. Second, the
technique is arbitrary and inflexible, since the technique has neither
a clearly-defined bank goal which guides the determination of the
various fund allocation procedures, nor a systematic procedure for
changing the allocation process as changing external conditions, such
as asset yields, dictate. Some of the more recent modeling techniques
described below avoid these difficulties.

Simulation. Perhaps the earliest modeling technique was the
application of simulation for financial management. Markowitz [27]
used this technique in employing quadratic programming as an illustration

of solving the problems of portfolio selection. This method consists of a blending of mathematical and statistical techniques to assist persons skilled in investment management. However, as with the techniques mentioned previously, Markowitz's technique does not consider some of the important interactions between income, liquidity, and risk. More recently, developments in applying the techniques of mathematics and economics by means of computers have enhanced the modeling of the financial decision process.

Linear Programming (LP). By use of the techniques of linear programming, it is possible to formulate a model which is a more factual representation of the banking environment to help management in its decision process. One application of an LP model was developed by Weingartner [32] for the financial planning problem of "capital budgeting under capital rationing". Other models for financial planning have also been developed by Baumol and Quandt [1] and Carleton [7].

In the area of portfolio management the first model was developed by Chambers and Charnes [9]. Their model is a comprehensive attempt at determining an optimal portfolio for an individual bank over several time periods in considering reserve requirements and a "balanced" portfolio. The reserve requirements state that part of the bank's assets must be held in cash or deposited with the Federal Reserve. The balanced portfolio restriction was a set of measures used by the bank examiners of the Federal Reserve System.

Another application of an LP model for portfolio management was developed at the Banker's Trust Company and is described in papers by Cohen and Hammer [12] and Cohen, Hammer, and Schneider [13]. The

objective of their model is to maximize net income while "(1) maintaining both a safe and an adequately liquid portfolio, and (2) assuring that neither the bank's short-run nor long-run flexibility will be impaired".

The model starts from the bank's initial position and works with management's best estimates of future interest rates in order to determine the ideal posture of the bank's portfolio. The model determines an optimal sequence of balance-sheet positions over the several planning periods that lie between the current date and the planning horizon. However, as with the aforementioned models, the Cohen and Hammer model is limited in that the model does not consider either the dynamic structure of the portfolio management problem or the uncertainty of future events. In an attempt to overcome these problems a dynamic model for bond portfolio management was developed by Bradley and Crane [5] which could have applications to other aspects of bank portfolio management.

The Bradley and Crane model is an LP model which includes both asset and liability positions of the bank, takes into account the uncertainty of future events, and considers the dynamic structure of the portfolio management problem. The model incorporates three decision variables, buy, sell, and hold, for each asset and liability, and forecasts the values of these variables over a specified multiperiod planning horizon. The model also facilitates the specification of variable-length periods for the planning horizon. It also considers the dynamic interactions between the various assets and liabilities and the probability of random events in predicting the decision variables over the planning horizon.

Finally, because the portfolio management problem can tend to become large and difficult to solve, Bradley and Crain discuss the decomposition algorithm of mathematical programming[1] in solving the overall portfolio management model.

## Summary

Any review of the current literature will reveal that modeling techniques are currently being applied to many areas of financial and bank management problems. This chapter has provided a brief discussion of the development of some analytical models, such as LP models, in the area of financial and bank management. The remainder of this study is concerned with a model for scheduling the issuance of large Certificates of Deposit for a commercial bank.

FOOTNOTE


[1]In the decomposition procedure some of the constraining equations
are treated implicitly as subproblems of the original LP. Solutions to
the subproblems are then used in obtaining the solution to the master
program. This technique permits the model to be large enough to solve
any realistic description of the portfolio management problem, while
cutting computing time and cost substantially. For a detailed explana-
tion of the decomposition procedure see references, Dantzig and Wolfe
[14] and [15], Gass [17], Himmelblau [23], and Zionts [33].

CHAPTER III

A REPORT GENERATING LINEAR PROGRAMMING MODEL

FOR SCHEDULING THE ISSUANCE OF LARGE

CERTIFICATES OF DEPOSIT

Introduction

The report generating model generates four different customized

management reports which summarize the LP program solution:

(1) Maturity Date Analysis by Type of Certificates of
    Deposit

(2) Predicted Certificates of Deposit Sales by Maturity
    Period

(3) Summary Totals by Month

(4) Graphical Summary.

Maturity Date Analysis Report

Within this report information predicted by the LP program is sum-

marized for the three CD markets serviced, local (type-0), national

(type-6), and special (type-8), for each of the thirteen months of the

planning horizon. This report presents the amounts of CD's maturing in

future periods, the percent of the total amount outstanding that that

amount represents, and an associated weighted average interest rate for

the outstanding amount of all instruments of a given type.

This maturity date analysis report provides a "picture" of the

bank's CD liability requirements for each of the thirteen planning periods by type of CD. Additionally, the report provides information for computing interest cost figures associated with the maturing CD amounts.

Figure 1 is the maturity date report for the 13-month period June, 1974 to June, 1975, coinciding with the fixed period covered by the model described in reference [20].

Predicted Sales Report

This report represents a summarization of the predicted sales amounts for the planning periods by type of CD and maturity period. For each type CD within a certain maturity period the beginning balance, current predicted sales, forecasted interest rate, and the net amount outstanding are reported.

Figure 2 gives the predicted sales report for the planning period June, 1974 to June, 1975.

Summary Report

This section (Figure 3) contains the summary totals of monthly sales, monthly payout of CD principles, and the total net amounts outstanding for each of the 13-months of the planning period.

Graphical Report

The graphical report (Figure 4) is divided into three sections: sales totals, summary totals, and cost. The sales totals section is a graphical representation of the total sales of each type of CD for each of the next thirteen months, plus the total of all sales for each month.

LIBERTY NATIONAL BANK

MATURITY DATE ANALYSIS BY TYPE OF CERTIFICATES CF DEPOSIT
(DOLLAR AMOUNTS IN THOUSANDS)

| TYPE 0 | | | TYPE 6 | | | TYPE 8 | | |
|---|---|---|---|---|---|---|---|---|
| CERT AMTS MATURING | PCT OF TOT AMT | WGHTD AVG INTST RATE | CERT AMTS MATURING | PCT OF TOT AMT | WGHTD AVG INTST RATE | CERT AMTS MATURING | PCT OF TOT AMT | WGHTD AV INTST RA |

JLN 1974
)***************

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| $ 28412.00 | 24.91 | 9.7163 | $ 2000.00 | 4.90 | 10.8746 | $ 350.00 | 16.44 | 7.999 |
| 38534.99 | 33.79 | 9.8680 | 12363.54 | 30.26 | 10.9999 | 1444.00 | 67.83 | 8.501 |
| 16344.00 | 14.33 | 10.2200 | 8885.44 | 21.75 | 9.5801 | 0.0 | 0.0 | 0.0 |
| 5410.63 | 4.74 | 8.2565 | 5920.00 | 14.49 | 10.3670 | 185.00 | 8.69 | 9.000 |
| 3169.70 | 2.78 | 10.0001 | 1685.44 | 4.13 | 10.6799 | 0.0 | 0.0 | 0.0 |
| 22174.00 | 19.44 | 8.9571 | 10000.00 | 24.48 | 9.4000 | 150.00 | 7.05 | 6.000 |
| 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| $ 114045.31 | | 9.6308 | $ 40854.42 | | 10.1884 | $ 2129.00 | | 8.286 |

JUL 1974
)***************

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| $ 38534.99 | 32.02 | 9.8680 | $ 12363.54 | 25.25 | 10.9999 | $ 1444.00 | 81.17 | 8.501 |
| 38092.91 | 31.65 | 10.0713 | 18994.55 | 38.79 | 10.2930 | 0.0 | 0.0 | 0.0 |
| 17893.18 | 14.87 | 9.4238 | 5920.00 | 12.09 | 10.3670 | 185.00 | 10.40 | 9.000 |
| 3169.70 | 2.63 | 10.0001 | 1685.44 | 3.44 | 10.6799 | 0.0 | 0.0 | 0.0 |
| 22174.00 | 18.42 | 8.9571 | 10000.00 | 20.42 | 9.4000 | 150.00 | 8.43 | 6.000 |
| 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| 487.20 | 0.40 | 9.5101 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| $ 120351.97 | | 9.7005 | $ 48963.53 | | 10.3114 | $ 1779.00 | | 8.342 |

ILG 1974
:***************

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| $ 38092.91 | 31.40 | 10.0713 | $ 18994.55 | 33.80 | 10.2930 | $ 0.0 | 0.0 | 0.0 |
| 41001.32 | 33.80 | 9.2808 | 20800.00 | 37.01 | 10.0756 | 185.00 | 55.22 | 9.000 |
| 3169.70 | 2.61 | 10.0001 | 6400.00 | 11.39 | 10.1274 | 0.0 | 0.0 | 0.0 |
| 34257.91 | 28.24 | 8.9757 | 10000.00 | 17.80 | 9.4000 | 150.00 | 44.78 | 6.000 |
| 4300.85 | 3.55 | 8.8500 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| 487.20 | 0.40 | 9.5101 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| $ 121309.89 | | 9.4473 | $ 56194.54 | | 10.0347 | $ 335.00 | | 7.656 |

Figure 1. Maturity Date Report

## LIBERTY NATIONAL BANK

### MATURITY DATE ANALYSIS BY TYPE CF CERTIFICATES CF DEPOSIT
### (DOLLAR AMOUNTS IN THOUSANDS)

| | TYPE 0 | | | TYPE 6 | | | TYPE 8 | | |
|---|---|---|---|---|---|---|---|---|---|
| | CERT AMTS MATURING | PCT OF TOT AMT | WGHTD AVG INTST RATE | CERT AMTS MATURING | PCT OF TOT AMT | WGHTD AVG INTST RATE | CERT AMTS MATURING | PCT OF TOT AMT | WGHTD INTST |
| **SEP 1974** | | | | | | | | | |
| 4 | $ 41001.32 | 32.59 | 9.2808 | $ 20800.00 | 35.49 | 10.0756 | $ 185.00 | 55.22 | 9.( |
| 4 | 27149.60 | 21.58 | 8.4019 | 19630.00 | 33.50 | 9.4083 | 0.0 | 0.0 | 0.( |
| 4 | 46978.21 | 37.34 | 8.7549 | 12295.44 | 20.98 | 9.3309 | 150.00 | 44.78 | 6.( |
| 4 | 4937.23 | 3.92 | 8.7443 | 3780.00 | 6.45 | 8.8999 | 0.0 | 0.0 | 0.( |
| 5 | 5736.95 | 4.56 | 8.0093 | 2094.56 | 3.57 | 8.7399 | 0.0 | 0.0 | 0.( |
| 5 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.( |
| 5 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.( |
| | $ 125803.31 | | 8.8157 | $ 58599.99 | | 9.5722 | $ 335.00 | | 7.( |
| **OCT 1974** | | | | | | | | | |
| 4 | $ 27149.60 | 23.95 | 8.4019 | $ 19630.00 | 33.83 | 9.4083 | $ 0.0 | 0.0 | 0. |
| 4 | 63923.30 | 56.39 | 8.4805 | 19779.99 | 34.09 | 8.9975 | 150.00 | 100.00 | 6.: |
| 4 | 5147.23 | 4.54 | 8.7013 | 7244.56 | 12.48 | 8.6704 | 0.0 | 0.0 | 0.( |
| 5 | 13751.75 | 12.13 | 7.7474 | 7710.00 | 13.29 | 8.4122 | 0.0 | 0.0 | 0.( |
| 5 | 3379.70 | 2.98 | 7.4001 | 3665.44 | 6.32 | 8.1301 | 0.0 | 0.0 | 0.( |
| 5 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.! |
| 5 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.( |
| | $ 113351.58 | | 8.3505 | $ 58029.99 | | 8.9631 | $ 150.00 | | 6.( |
| **NOV 1974** | | | | | | | | | |
| 4 | $ 63923.30 | 42.14 | 8.4805 | $ 19779.99 | 37.37 | 8.9975 | $ 150.00 | 100.00 | 6.( |
| 4 | 26055.80 | 17.18 | 7.5690 | 13539.11 | 25.58 | 8.3817 | 0.0 | 0.0 | 0.' |
| 5 | 27097.59 | 17.87 | 7.5073 | 10095.44 | 19.07 | 8.3196 | 0.0 | 0.0 | 0. |
| 5 | 8527.70 | 5.62 | 7.2371 | 3665.44 | 6.93 | 8.1301 | 0.0 | 0.0 | 0.( |
| 5 | 13395.30 | 8.83 | 6.9700 | 5850.00 | 11.05 | 7.7301 | 0.0 | 0.0 | 0.( |
| 5 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.( |
| 5 | 12675.60 | 8.36 | 6.8401 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.( |
| | $ 151675.29 | | 7.8096 | $ 52929.99 | | 8.5105 | $ 150.00 | | 6.( |

Figure 1. (Continued)

LIBERTY NATIONAL BANK

MATURITY DATE ANALYSIS BY TYPE OF CERTIFICATES OF DEPOSIT
(DOLLAR AMOUNTS IN THOUSANDS)

| | TYPE 0 | | | TYPE 6 | | | TYPE 8 | | |
|---|---|---|---|---|---|---|---|---|---|
| | CERT AMTS MATURING | PCT OF TOT AMT | WGHTD AVG INTST RATE | CERT AMTS MATURING | PCT OF TOT AMT | WGHTD AVG INTST RATE | CERT AMTS MATURING | PCT OF TOT AMT | WGHTD INTST |
| **CEC 1974** | | | | | | | | | |
| 4 | $ 26055.80 | 22.89 | 7.5650 | $ 13539.11 | 25.77 | 8.3817 | $ 0.0 | 0.0 | 0. |
| 5 | 40260.39 | 35.38 | 7.4232 | 19935.44 | 37.94 | 8.1124 | 0.0 | 0.0 | 0. |
| 5 | 2142C.7C | 18.82 | 7.2266 | 7130.00 | 13.57 | 8.0037 | 0.0 | 0.0 | 0. |
| 5 | 13395.30 | 11.77 | 6.9700 | 6C84.56 | 11.58 | 7.7305 | 0.0 | 0.0 | 0. |
| 5 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0. |
| 5 | 12675.60 | 11.14 | 6.8401 | 0.C | 0.0 | 0.0 | 0.0 | 0.0 | 0. |
| 5 | 0.0 | 0.0 | 0.0 | 5850.00 | 11.13 | 7.5999 | 0.0 | 0.0 | 0. |
| | $ 113807.78 | | 7.3013 | $ 52539.11 | | 8.0657 | $ 0.0 | | 0. |
| **JAN 1975** | | | | | | | | | |
| 5 | $ 40260.39 | 31.45 | 7.4232 | $ 19935.44 | 37.55 | 8.1124 | $ 0.0 | 0.0 | 0. |
| 5 | 34583.49 | 27.02 | 7.1576 | 12980.00 | 24.45 | 7.9388 | 0.0 | 0.0 | 0. |
| 5 | 13665.10 | 10.67 | 6.9729 | 8470.00 | 15.96 | 7.7585 | 0.0 | 0.0 | 0. |
| 5 | 13177.8C | 10.29 | 6.9902 | 5850.00 | 11.02 | 7.6999 | 0.0 | 0.0 | 0. |
| 5 | 12675.60 | 9.90 | 6.8401 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0. |
| 5 | 0.0 | 0.0 | 0.0 | 5850.00 | 11.02 | 7.5999 | 0.0 | 0.0 | 0. |
| 5 | 13650.00 | 10.66 | 6.7000 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0. |
| | $ 128012.38 | | 7.1348 | $ 53085.44 | | 7.9115 | $ 0.0 | | 0. |
| **FEB 1975** | | | | | | | | | |
| 5 | $ 34583.49 | 28.27 | 7.1976 | $ 12980.00 | 24.97 | 7.9388 | $ 0.0 | 0.0 | 0. |
| 5 | 35355.59 | 28.90 | 6.9892 | 17985.44 | 34.60 | 7.6852 | 0.0 | 0.0 | 0. |
| 5 | 26070.80 | 21.31 | 6.9803 | 9314.56 | 17.92 | 7.6591 | 0.0 | 0.0 | 0. |
| 5 | 12675.60 | 10.36 | 6.8401 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0. |
| 5 | 0.0 | 0.0 | 0.0 | 5850.00 | 11.25 | 7.5999 | 0.0 | 0.0 | 0. |
| 5 | 13650.00 | 11.16 | 6.7C00 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0. |
| 5 | 0.0 | 0.0 | 0.0 | 5850.00 | 11.25 | 7.4C99 | 0.0 | 0.0 | 0. |
| | $ 122335.48 | | 6.9985 | $ 51980.00 | | 7.7C33 | $ 0.0 | | 0. |

Figure 1.  (Continued)

LIBERTY NATIONAL BANK

MATURITY DATE ANALYSIS BY TYPE OF CERTIFICATES CF DEPOSIT
(DOLLAR AMOUNTS IN THOUSANDS)

| | TYPE 0 | | | | TYPE 6 | | | | TYPE 8 | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | CERT AMTS MATURING | PCT OF TOT AMT | WGHTC AVG INTST RATE | | CERT AMTS MATURING | PCT OF TOT AMT | WGHTD AVG INTST RATE | | CERT AMTS MATURING | PCT OF TOT AMT | WGHTD INTST |

MAR 1975
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| 5 | $ 35355.59 | 28.70 | 6.9892 | $ 17985.44 | 31.56 | 7.6852 | $ 0.0 | 0.0 | 0.( |
| 5 | 39248.59 | 31.86 | 7.0137 | 15164.56 | 26.61 | 7.6323 | 0.0 | 0.0 | 0.( |
| 5 | 13432.60 | 10.90 | 6.8519 | 2385.44 | 4.19 | 7.5598 | 0.0 | 0.0 | 0.( |
| 5 | 0.0 | 0.0 | 0.0 | 5850.00 | 10.27 | 7.5999 | 0.0 | 0.0 | 0.( |
| 5 | 35170.80 | 28.55 | 6.7368 | 9750.00 | 17.11 | 7.2699 | 0.0 | 0.0 | 0.( |
| 5 | 0.0 | 0.0 | 0.0 | 5850.00 | 10.27 | 7.4099 | 0.0 | 0.0 | 0.( |
| 5 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.( |
| | $ 123207.58 | | 6.9100 | $ 56985.44 | | 7.5578 | $ 0.0 | | 0.( |

APR 1975
**************

| 5 | $ 39248.59 | 30.88 | 7.0137 | $ 15164.56 | 28.00 | 7.6323 | $ 0.0 | 0.0 | 0.( |
| 5 | 26610.39 | 20.94 | 6.9957 | 8235.44 | 15.20 | 7.6881 | 0.0 | 0.0 | 0.( |
| 5 | 12420.80 | 9.77 | 7.1199 | 9314.56 | 17.20 | 7.6409 | 0.0 | 0.0 | 0.( |
| 5 | 48820.80 | 38.41 | 6.8076 | 15600.00 | 28.80 | 7.3861 | 0.0 | 0.0 | 0.( |
| 5 | 0.0 | 0.0 | 0.0 | 5850.00 | 10.80 | 7.4099 | 0.0 | 0.0 | 0.( |
| 5 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.( |
| 5 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.( |
| | $ 127100.58 | | 6.9420 | $ 54164.55 | | 7.5473 | $ 0.0 | | 0.( |

MAY 1975
**************

| 5 | $ 26610.39 | 22.63 | 6.9957 | $ 8235.44 | 15.51 | 7.6881 | $ 0.0 | 0.0 | 0.( |
| 5 | 27300.00 | 23.21 | 7.1856 | 15164.56 | 28.57 | 7.7332 | 0.0 | 0.0 | 0.( |
| 5 | 63700.00 | 54.16 | 6.9016 | 23835.44 | 44.90 | 7.5464 | 0.0 | 0.0 | 0.( |
| 5 | 0.0 | 0.0 | 0.0 | 5850.00 | 11.02 | 7.4099 | 0.0 | 0.0 | 0.( |
| 5 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.( |
| 5 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.( |
| 5 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.( |
| | $ 117610.39 | | 6.9897 | $ 53085.44 | | 7.6067 | $ 0.0 | | 0.( |

Figure 1. (Continued)

LIBERTY NATIONAL BANK

MATURITY CATE ANALYSIS BY TYPE OF CERTIFICATES CF DEPOSIT
(DCLLAR AMOUNTS IN THOUSANDS)

| | TYPE 0 | | | | TYPE 6 | | | | TYPE 8 | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | CERT AMTS MATURING | PCT OF TOT AMT | WGHTD AVG INTST RATE | | CERT AMTS MATURING | PCT OF TOT AMT | WGHTD AVG INTST RATE | | CERT AMTS MATURING | PCT OF TCT AMT | WGHTD INTST |

JUN 1975

| 5 | $ 273CC.CC | 23.08 | 7.1856 | $ 15164.56 | 28.00 | 7.7332 | $ 0.0 | 0.0 | 0.( |
| 5 | 91000.00 | 76.92 | 7.0302 | 33149.99 | 61.20 | 7.6990 | 0.0 | 0.0 | 0.( |
| 5 | 0.0 | 0.0 | 0.0 | 5850.00 | 10.80 | 7.4C99 | 0.0 | 0.0 | 0.( |
| 5 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.( |
| 5 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.( |
| 5 | 0.C | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0. |
| 5 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0. |

| | $ 118299.99 | | 7.0661 | $ 54164.55 | | 7.6774 | $ 0.0 | | 0. |

Figure 1.  (Continued)

LIBERTY NATIONAL BANK

PREDICTED CERTIFICATES OF DEPOSIT SALES BY MATURITY PERIOD

**************************

30 DAY MATURITY

**************************

(DOLLAR AMOUNTS IN THOUSANDS)

|  | TYPE 0 | | | TYPE 6 | | | TYPE 8 | | |
|---|---|---|---|---|---|---|---|---|---|
|  | ************************************* | | | ************************************* | | | ************************************* | | |
|  | BEGINNING BALANCE $ 28412.00 | | | BEGINNING BALANCE $ 2000.00 | | | BEGINNING BALANCE $ 350.00 | | |
| MONTH | CURRENT SALES | INTST RATE | NET AMOUNT OUTSTANDING | CURRENT SALES | INTST RATE | NET AMOUNT OUTSTANDING | CURRENT SALES | INTST RATE | NET AMOUNT OUTSTANDING |
| JUN 74 | $ 12845.00 | 10.320 | $ 12845.00 | $ 12363.54 | 11.000 | $ 12363.54 | $ 0.0 | 11.000 | $ 0.0 |
| JUL 74 | 21748.91 | 9.960 | 21748.91 | 10109.11 | 10.920 | 10109.11 | 0.0 | 10.920 | 0.0 |
| AUG 74 | 23108.15 | 9.170 | 23108.15 | 14880.00 | 9.960 | 14880.00 | 0.0 | 9.960 | 0.0 |
| SEP 74 | 23979.90 | 8.191 | 23979.90 | 13230.00 | 9.061 | 13230.00 | 0.0 | 9.061 | 0.0 |
| OCT 74 | 16945.10 | 7.720 | 16945.10 | 7484.55 | 8.450 | 7484.55 | 0.0 | 8.450 | 0.0 |
| NOV 74 | 20908.57 | 7.290 | 20908.57 | 6294.55 | 8.049 | 6294.55 | 0.0 | 8.049 | 0.0 |
| DEC 74 | 13162.80 | 7.250 | 13162.80 | 9840.00 | 7.900 | 9840.00 | 0.0 | 7.900 | 0.0 |
| JAN 75 | 13162.80 | 7.150 | 13162.80 | 5850.00 | 7.860 | 5850.00 | 0.0 | 7.860 | 0.0 |
| FEB 75 | 21690.50 | 6.999 | 21690.50 | 9515.44 | 7.620 | 9515.44 | 0.0 | 7.620 | 0.0 |
| MAR 75 | 13177.80 | 7.080 | 13177.80 | 5850.00 | 7.590 | 5850.00 | 0.0 | 7.590 | 0.0 |
| APR 75 | 13177.80 | 7.150 | 13177.80 | 5850.00 | 7.740 | 5850.00 | 0.0 | 7.740 | 0.0 |
| MAY 75 | 14879.20 | 7.240 | 14879.20 | 5850.00 | 7.880 | 5850.00 | 0.0 | 7.880 | 0.0 |
| JUN 75 | 27300.00 | 7.330 | 27300.00 | 9314.55 | 8.090 | 9314.55 | 0.0 | 8.090 | 0.0 |
|  | $236086.50 | | | $116431.75 | | | $ 0.0 | | |

Figure 2. Predicted Sales Report

LIBERTY NATIONAL BANK

PREDICTED CERTIFICATES OF DEPOSIT SALES BY MATURITY PERIOD

\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*

60 DAY MATURITY

\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*

(DOLLAR AMOUNTS IN THOUSANDS)

|  | TYPE 0 | | | TYPE 6 | | | TYPE 8 | | |
|---|---|---|---|---|---|---|---|---|---|
|  | BEGINNING BALANCE $ 25690.00 | | | BEGINNING BALANCE $ 0.0 | | | BEGINNING BALANCE $ 1444.00 | | |
| MONTH | CURRENT SALES | INTST RATE | NET AMOUNT OUTSTANDING | CURRENT SALES | INTST RATE | NET AMOUNT OUTSTANDING | CURRENT SALES | INTST RATE | NET AMOUNT OUTSTANDING |
| JUN 74 | $ 0.0 | 10.290 | $ 25690.00 | $ 3885.44 | 10.970 | $ 3885.44 | $ 0.C | 10.970 | $ 1444.00 |
| JUL 74 | 12482.55 | 9.930 | 12482.55 | 0.0 | 10.890 | 3885.44 | 0.0 | 10.890 | 0.0 |
| AUG 74 | 0.0 | 9.140 | 12482.55 | 4714.55 | 9.930 | 4714.55 | 0.0 | 9.930 | 0.0 |
| SEP 74 | 12720.30 | 8.160 | 12720.30 | 2295.44 | 9.030 | 7010.00 | 0.0 | 9.030 | 0.0 |
| OCT 74 | 210.00 | 7.690 | 12530.30 | 3464.56 | 8.420 | 5760.00 | 0.0 | 8.420 | 0.0 |
| NOV 74 | 13345.85 | 7.260 | 13555.85 | 2385.44 | 8.020 | 5850.00 | 0.0 | 8.020 | 0.0 |
| CEC 74 | 12893.CC | 7.220 | 26238.85 | 3464.56 | 7.870 | 5850.00 | 0.0 | 7.870 | 0.0 |
| JAN 75 | 269.80 | 7.120 | 13162.80 | 2385.44 | 7.830 | 5850.00 | 0.0 | 7.830 | 0.0 |
| FEB 75 | 12893.CC | 6.970 | 13162.80 | 3464.56 | 7.590 | 5850.00 | 0.0 | 7.590 | 0.0 |
| MAR 75 | 757.00 | 7.050 | 13650.0C | 2385.44 | 7.560 | 5850.00 | 0.0 | 7.560 | 0.0 |
| APR 75 | 12420.80 | 7.120 | 13177.80 | 3464.56 | 7.710 | 5850.00 | 0.0 | 7.710 | 0.0 |
| MAY 75 | 14879.20 | 7.210 | 27300.00 | 8235.44 | 7.850 | 11700.00 | 0.0 | 7.850 | 0.0 |
| JUN 75 | 0.0 | 7.300 | 14879.20 | 0.0 | 8.060 | 8235.44 | 0.0 | 8.060 | 0.0 |
|  | $ 92871.49 | | | $ 40145.44 | | | $ 0.0 | | |

Figure 2.   (Continued)

18

LIBERTY NATIONAL BANK

PREDICTED CERTIFICATES OF DEPOSIT SALES BY MATURITY PERIOD

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90 DAY MATURITY

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(DOLLAR AMOUNTS IN THOUSANDS)

| | TYPE 0 | | | TYPE 6 | | | TYPE 8 | | |
|---|---|---|---|---|---|---|---|---|---|
| | ************************************* | | | ************************************* | | | ************************************* | | |
| | BEGINNING BALANCE $ 16344.00 | | | BEGINNING BALANCE $ 5000.00 | | | BEGINNING BALANCE $ 0.0 | | |
| MONTH | CURRENT SALES | INTST RATE | NET AMOUNT OUTSTANDING | CURRENT SALES | INTST RATE | NET AMOUNT OUTSTANDING | CURRENT SALES | INTST RATE | NET AMOUNT OUTSTANDING |
| JUN 74 | $ 398.63 | 10.160 | $ 16742.63 | $ 3720.00 | 10.840 | $ 8720.00 | $ 0.0 | 10.840 | $ 0.0 |
| JUL 74 | 0.0 | 9.800 | 16742.63 | 0.0 | 10.760 | 8720.00 | 0.0 | 10.760 | 0.0 |
| AUG 74 | 12083.91 | 9.010 | 12482.55 | 0.0 | 9.800 | 3720.00 | 0.0 | 9.800 | 0.0 |
| SEP 74 | 636.38 | 8.030 | 12720.30 | 3780.00 | 8.900 | 3780.00 | 0.0 | 8.900 | 0.0 |
| OCT 74 | 8014.80 | 7.560 | 20735.10 | 5615.44 | 8.290 | 9395.44 | 0.0 | 8.290 | 0.0 |
| NOV 74 | 5148.00 | 7.130 | 13795.18 | 0.0 | 7.890 | 9395.44 | 0.0 | 7.890 | 0.0 |
| DEC 74 | 0.0 | 7.090 | 13162.80 | 234.56 | 7.740 | 5850.00 | 0.0 | 7.740 | 0.0 |
| JAN 75 | 13177.80 | 6.990 | 18325.80 | 5850.00 | 7.700 | 6084.55 | 0.0 | 7.700 | 0.0 |
| FEB 75 | 0.0 | 6.840 | 13177.80 | 0.0 | 7.460 | 6084.55 | 0.0 | 7.460 | 0.0 |
| MAR 75 | 0.0 | 6.920 | 13177.80 | 0.0 | 7.430 | 5850.00 | 0.0 | 7.430 | 0.0 |
| APR 75 | 13650.00 | 6.990 | 13650.00 | 5850.00 | 7.580 | 5850.00 | 0.0 | 7.580 | 0.0 |
| MAY 75 | 0.0 | 7.080 | 13650.00 | 0.0 | 7.720 | 5850.00 | 0.0 | 7.720 | 0.0 |
| JUN 75 | 0.0 | 7.170 | 13650.00 | 0.0 | 7.930 | 5850.00 | 0.0 | 7.930 | 0.0 |
| | ---------- | | | ---------- | | | ---------- | | |
| | $ 53109.52 | | | $ 25050.00 | | | $ 0.0 | | |

Figure 2. (Continued)

LIBERTY NATIONAL BANK

PREDICTED CERTIFICATES OF DEPOSIT SALES BY MATURITY PERIOD

\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*

120 DAY MATURITY

\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*

(DOLLAR AMOUNTS IN THOUSANDS)

|  | TYPE 0 | | | TYPE 6 | | | TYPE 8 | | |
|---|---|---|---|---|---|---|---|---|---|
| | \*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\* | | | \*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\* | | | \*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\* | | |
| | BEGINNING BALANCE $ 5012.00 | | | BEGINNING BALANCE $ 2200.00 | | | BEGINNING BALANCE $ 185.00 | | |
| MONTH | CURRENT SALES | INTST RATE | NET AMOUNT OUTSTANDING | CURRENT SALES | INTST RATE | NET AMOUNT OUTSTANDING | CURRENT SALES | INTST RATE | NET AMOUNT OUTSTANDING |
| JUN 74 | $ 3169.70 | 10.000 | $ 8181.70 | $ 1685.44 | 10.680 | $ 3885.44 | $ 0.0 | 10.680 | $ 185.00 |
| JUL 74 | 0.C | 9.640 | 8181.7C | 0.0 | 10.600 | 3885.44 | 0.0 | 10.600 | 185.0C |
| AUG 74 | 4300.85 | 8.850 | 12482.55 | 0.0 | 9.640 | 3885.44 | 0.0 | 9.640 | 185.00 |
| SEP 74 | 5249.75 | 7.870 | 12720.30 | 2094.56 | 8.740 | 3780.00 | 0.0 | 8.740 | 0.0 |
| CCT 74 | 3379.70 | 7.400 | 12930.30 | 3665.44 | 8.130 | 5760.00 | 0.0 | 8.130 | 0.0 |
| NOV 74 | 13395.30 | 6.970 | 26325.60 | 5850.00 | 7.730 | 11610.00 | 0.0 | 7.730 | 0.0 |
| DEC 74 | 0.0 | 6.930 | 22024.75 | 0.0 | 7.580 | 11610.00 | 0.0 | 7.580 | 0.0 |
| JAN 75 | 0.0 | 6.830 | 16775.00 | 0.0 | 7.540 | 9515.44 | 0.0 | 7.540 | 0.0 |
| FEB 75 | 0.C | 6.680 | 13395.30 | 0.0 | 7.300 | 5850.00 | 0.0 | 7.300 | 0.0 |
| MAR 75 | 21520.80 | 6.760 | 21520.80 | 9750.00 | 7.270 | 9750.00 | 0.0 | 7.270 | 0.0 |
| APR 75 | 0.0 | 6.830 | 21520.80 | 0.0 | 7.420 | 9750.00 | 0.0 | 7.420 | 0.0 |
| MAY 75 | 0.0 | 6.920 | 21520.80 | 0.0 | 7.560 | 9750.00 | 0.0 | 7.560 | 0.0 |
| JUN 75 | 0.0 | 7.010 | 21520.80 | 0.0 | 7.770 | 9750.00 | 0.0 | 7.770 | 0.0 |
| | $ 51016.09 | | | $ 23045.44 | | | $ 0.0 | | |

Figure 2. (Continued)

LIBERTY NATIONAL BANK

PREDICTED CERTIFICATES OF DEPOSIT SALES BY MATURITY PERIOD

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180 DAY MATURITY

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(DOLLAR AMOUNTS IN THOUSANDS)

|  | TYPE 0 | | | TYPE 6 | | | TYPE 8 | | |
|---|---|---|---|---|---|---|---|---|---|
|  | ************************************ | | | ************************************ | | | ************************************ | | |
|  | BEGINNING BALANCE $ 22174.00 | | | BEGINNING BALANCE $ 10000.00 | | | BEGINNING BALANCE $ 150.00 | | |
| MONTH | CURRENT SALES | INTST RATE | NET AMOUNT OUTSTANDING | CURRENT SALES | INTST RATE | NET AMOUNT OUTSTANDING | CURRENT SALES | INTST RATE | NET AMOUNT OUTSTANDING |
| JUN 74 | $ 0.0 | 9.870 | $ 22174.00 | $ 0.0 | 10.550 | $ 10000.00 | $ 0.0 | 10.550 | $ 150.00 |
| JUL 74 | 487.20 | 9.510 | 22661.20 | 0.0 | 10.470 | 10000.00 | 0.0 | 10.470 | 150.00 |
| AUG 74 | 0.0 | 8.720 | 22661.20 | 0.0 | 9.510 | 10000.00 | 0.0 | 9.510 | 150.00 |
| SEP 74 | 0.0 | 7.740 | 22661.20 | 0.0 | 8.610 | 10000.00 | 0.0 | 8.610 | 150.00 |
| OCT 74 | 0.0 | 7.270 | 22661.20 | 0.0 | 8.000 | 10000.00 | 0.0 | 8.000 | 150.00 |
| NOV 74 | 12675.60 | 6.840 | 13162.80 | 5850.00 | 7.600 | 5850.00 | 0.0 | 7.600 | 0.0 |
| DEC 74 | 0.0 | 6.800 | 13162.80 | 0.0 | 7.450 | 5850.00 | 0.0 | 7.450 | 0.0 |
| JAN 75 | 13650.00 | 6.700 | 26325.60 | 5850.00 | 7.410 | 11700.00 | 0.0 | 7.410 | 0.0 |
| FEB 75 | 0.0 | 6.550 | 26325.60 | 0.0 | 7.170 | 11700.00 | 0.0 | 7.170 | 0.0 |
| MAR 75 | 0.0 | 6.630 | 26325.60 | 0.0 | 7.140 | 11700.00 | 0.0 | 7.140 | 0.0 |
| APR 75 | 0.0 | 6.700 | 26325.60 | 0.0 | 7.290 | 11700.00 | 0.0 | 7.290 | 0.0 |
| MAY 75 | 0.0 | 6.790 | 13650.00 | 0.0 | 7.430 | 5850.00 | 0.0 | 7.430 | 0.0 |
| JUN 75 | 0.0 | 6.880 | 13650.00 | 0.0 | 7.640 | 5850.00 | 0.0 | 7.640 | 0.0 |
|  | $ 26812.80 | | | $ 11700.00 | | | $ 0.0 | | |

Figure 2.  (Continued)

21

LIBERTY NATIONAL BANK

SUMMARY TOTALS BY MONTH

(DOLLAR AMOUNTS IN THOUSANDS)

| MONTH | MONTHLY SALES | MONTHLY PAYOUT | NET AMOUNT OUTSTANDING |
|---|---|---|---|
| JUN 74 | $ 38067.76 | $ 30762.00 | $129514.75 |
| JUL 74 | 44827.78 | 52342.54 | 121999.54 |
| AUG 74 | 59087.47 | 57087.47 | 123999.94 |
| SEP 74 | 63986.33 | 61986.33 | 125999.94 |
| OCT 74 | 48779.60 | 46779.60 | 127999.54 |
| NOV 74 | 85853.31 | 83853.31 | 129999.94 |
| DEC 74 | 39594.91 | 39594.91 | 125999.54 |
| JAN 75 | 60195.84 | 60195.84 | 129999.94 |
| FEB 75 | 47563.50 | 47563.50 | 129999.94 |
| MAR 75 | 53441.04 | 53441.04 | 125999.54 |
| APR 75 | 54413.16 | 54413.16 | 129999.94 |
| MAY 75 | 43843.84 | 43843.84 | 129999.94 |
| JUN 75 | 36614.55 | 36614.55 | 129999.94 |

Figure 3.   Summary Report

This graph provides an illustration for comparing the future sales of CD's in each of the markets being serviced.

The second section is of the summary totals of the LP program and represents the same information of the summary totals report.

The last section of the graphical report is the cost graph. This graph depicts the total amount paid out in interest for all CD's for each month of the 13-month planning period.

Although the graphical report can only be interpreted with approximate values, the report is useful as a pictorial representation of the LP solution. Thus, management is provided with a ready reference of the growth pattern and the approximate cost of the CD portfolio over the planning horizon.

## "Rolling Feature"

As mentioned earlier in this study, the model is designed to be general in that any 13-month period can be represented. This "rolling feature" provides management with the four reports described above for any, or all, of the months of the planning period. Figure 5 is an example of this feature for the 13-month period of December, 1974 to December, 1975, inclusive.

## Summary

The model generates four management reports based on the solution of the LP problem. These reports provide management with analytical tools to be used in planning a balanced liability portfolio.
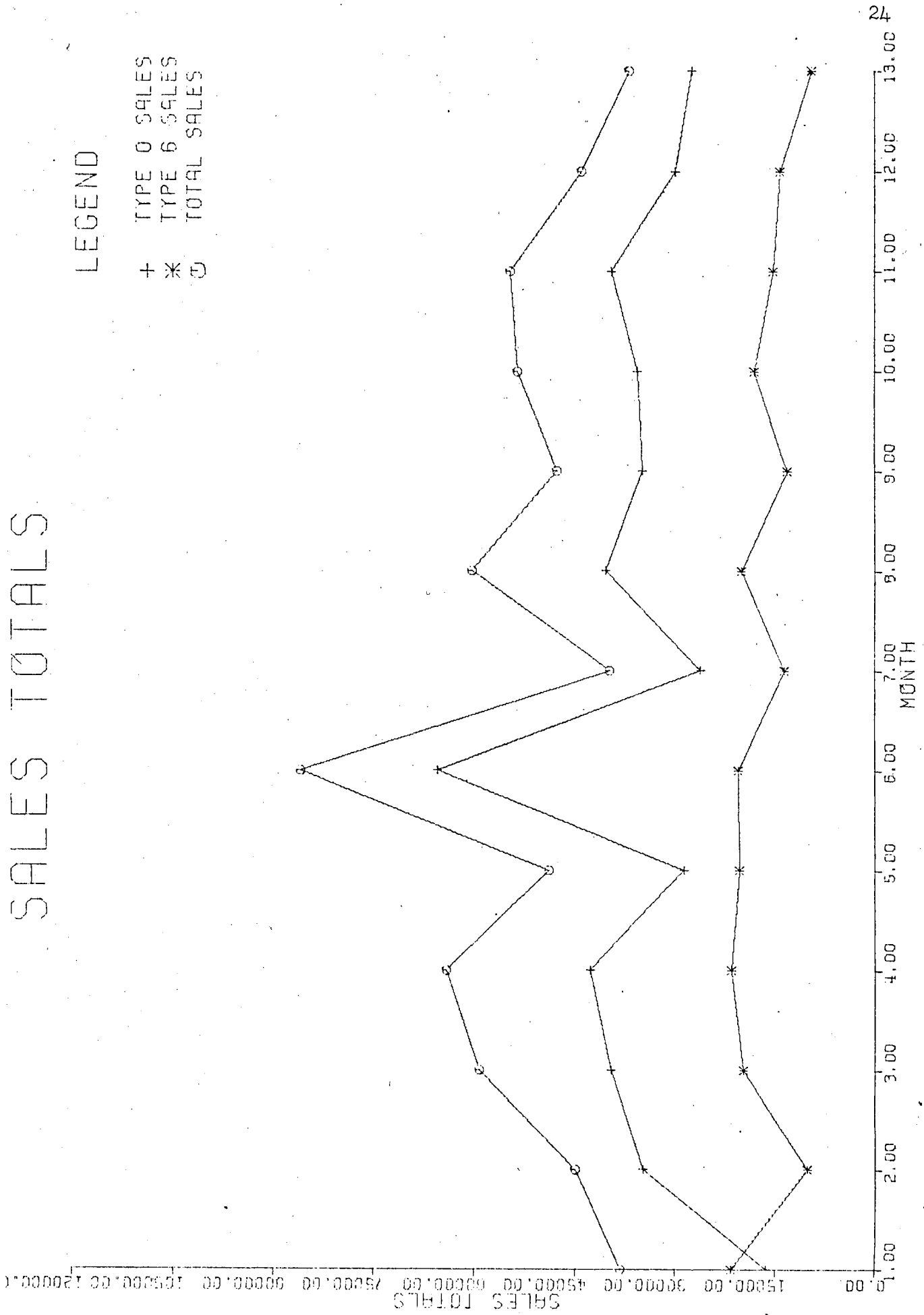
# SALES TOTALS



Figure 4. Graphical Report.

# SUMMARY TOTALS

LEGEND
+   SALES
✳   PAYOUT
⊙   NET AMOUNT
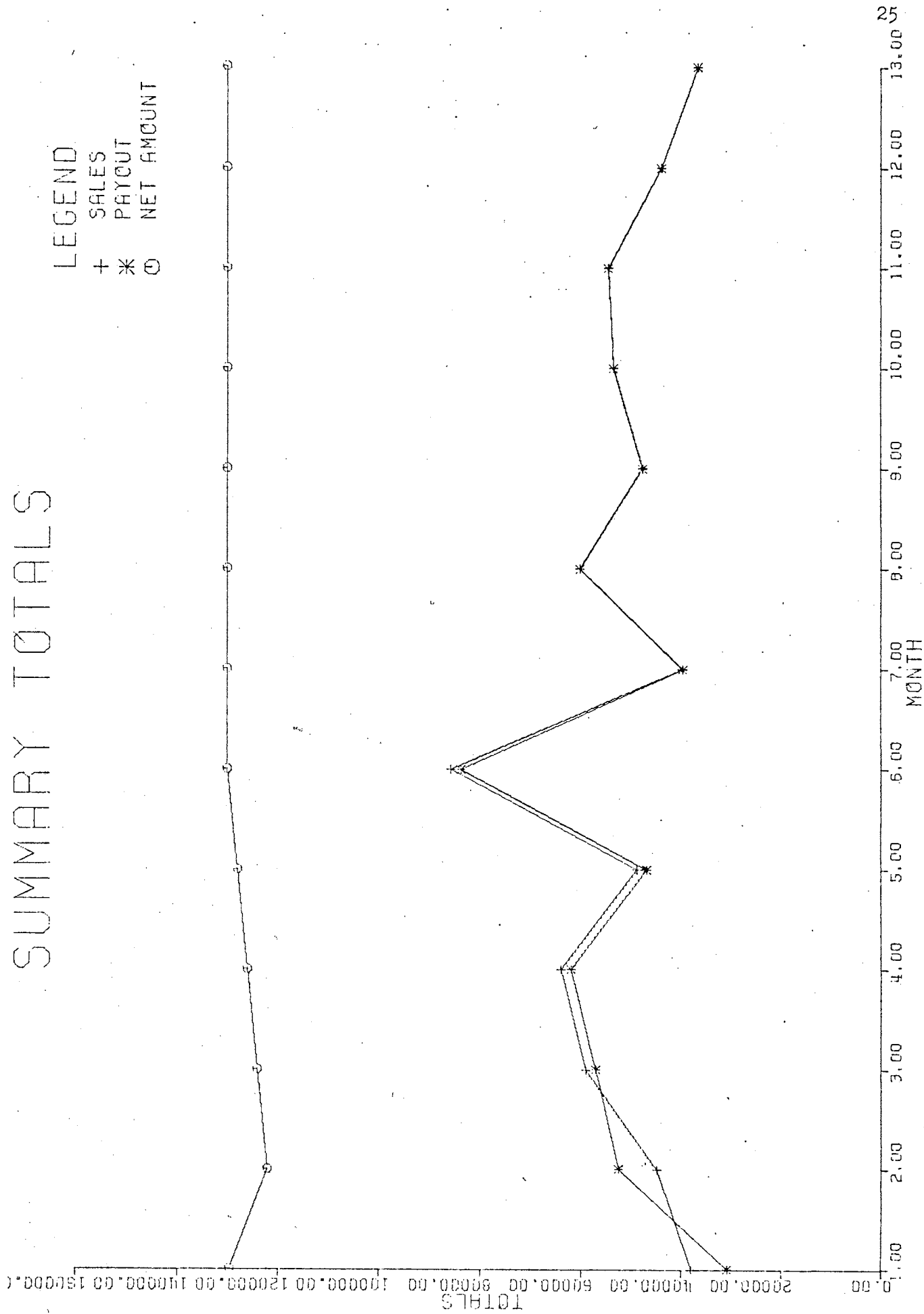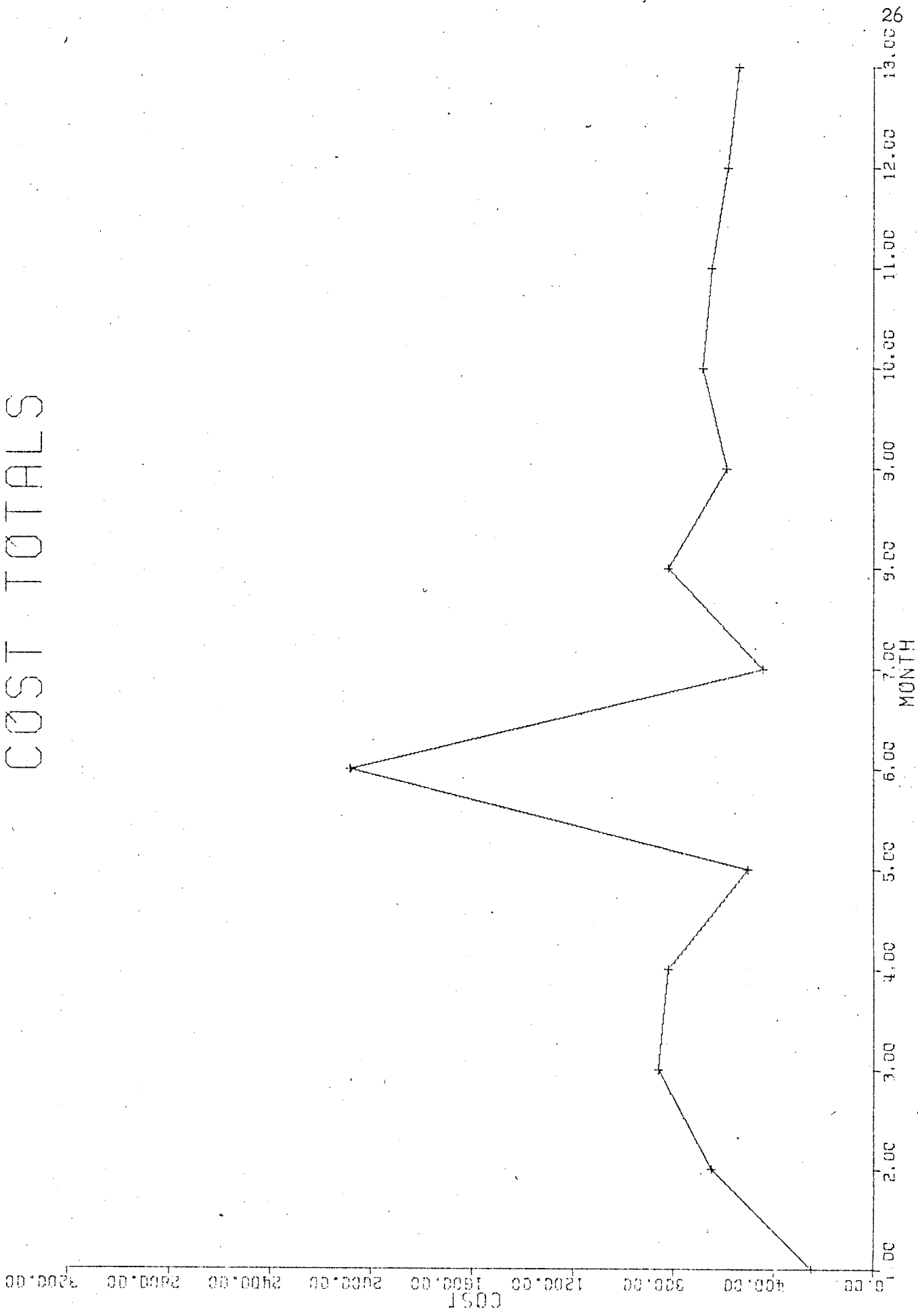
Figure 1. (Continued)

Figure 4. (Continued)

LIBERTY NATIONAL BANK

SUMMARY TOTALS BY MONTH

(DOLLAR AMOUNTS IN THOUSANDS)

| MONTH | MONTHLY SALES | MONTHLY PAYOUT | NET AMOUNT OUTSTANDING |
|---|---|---|---|
| DEC 74 | $ 88837.88 | $ 15770.10 | $129999.94 |
| JAN 75 | 88837.88 | 15770.10 | 129999.94 |
| FEB 75 | 56767.52 | 56767.52 | 129999.94 |
| MAR 75 | 55330.76 | 55330.76 | 129999.94 |
| APR 75 | 89050.00 | 89050.00 | 129999.94 |
| MAY 75 | 64350.00 | 64350.00 | 129999.94 |
| JUN 75 | 61947.84 | 61947.84 | 129999.94 |
| JUL 75 | 53102.16 | 53102.16 | 129999.94 |
| AUG 75 | 72602.13 | 72602.13 | 129999.94 |
| SEP 75 | 31397.84 | 31397.84 | 129999.94 |
| OCT 75 | 70002.13 | 70002.13 | 129999.94 |
| NOV 75 | 42447.84 | 42447.84 | 129999.94 |
| DEC 75 | 39000.00 | 39000.00 | 129999.94 |

Figure 5. Example of "Rolling Feature"

CHAPTER IV

IMPLEMENTATION AND IMPLICATIONS

The model predicts an optimal CD sales schedule for thirteen months
while minimizing the total interest costs of the sales over the planning
period. The optimal solution is subject to constraints reflecting bank
management policy with respect to growth objectives, balance amounts
outstanding, minimum sales, and prevention of rapid turnover of certain
types of CD's. However, the model's use as an effective liability man-
agement model is limited. As discussed in Chapter II, an effective
portfolio management model must assist bank management in achieving a
proper balance between income, liquidity, and risk. The model consid-
ered in this study involves only one type of liability, Certificates of
Deposit, and assumes certainty. Thus, the study implies certain improve-
ments are available to make this model a more effective analytical tool
for management.

Perhaps the most important improvement suggested deals with the
decision variables. In order to achieve a balance between income,
liquidity, and risk, other details of the bank's balance sheet should be
included as decision variables or as constraining equations. The inter-
relationships between a bank's assets and liabilities, liquidity posi-
tion, and Federal Reserve minimum deposit regulations necessitate the
inclusion of these additional variables.

A second important consideration for improvement of the model is

the forecasts of future interest rates, loan demand, and future levels of deposits within the planning period. These forecasts must be made while considering the various types and maturities of relevant assets, liabilities, and capital items of the balance sheet. The method used in forecasting should be able to incorporate conditions of uncertainty and variations in economic conditions. These interrelationships must be realistically included in the forecasts if the model is to produce useable management results.

Another implication of the study is the structure and number of the constraints of the model. A linear programming model can accommodate as many constraints as bank managers consider relevant to the portfolio decision process. Detailed and realistic sets of liquidity constraints should be built into the model reflecting liability and capital structures, cash flow patterns, and miscellaneous restrictions imposed by management on the basis of experience. Other constraints are also conceivable, reflecting legal reserve requirements and the use of certain assets as collateral to support government deposits. Moreover, the linear programming model must include constraints reflecting well defined bank goals and management policies.

Another implication discussed in Cohen and Hammer [12] concerns the use of the dual variables that are a product of the LP solution. The dual solution indicates the incremental benefits associated with a marginal increase, or decrease, of any of the model's constraints. Thus, the model can provide information useful in determining the marginal rate of return on capital, the maximum interest rate to pay for additional CD's and opportunity costs associated with various management policies.

Similarly, the MPSX procedure includes features for sensitivity analysis of the model's variables. The RANGE function causes the program to automatically determine an upper and lower bound on the variables of the model in order that the solution remain optimal. MPSX also includes a feature that allows the programmer to define certain bounds for the coefficients of the variables and have the program increment those coefficients until the solution is no longer optimal. These features allow the programmer considerable latitude in simulating varying economic conditions and management policies.

In summary, the LP model should include comprehensive risk constraints, policy considerations, and economic and institutional considerations which must be evaluated in order to make relevant portfolio management decisions.

CHAPTER V

SUMMARY AND RECOMMENDATIONS

The application of linear programming to bank management appears to be one of the more important recent developments in banking. The current study has dealt with one such LP model; a report generating LP model for scheduling the issuance of large CD's.

The objective of the study has been to construct a model to provide an output of selected LP solution data in a management type of report form. This was accomplished by using a special feature of the MPS called READCOMM. READCOMM allows the LP program to access an external program to report selected MPSX solution data.

As a result of the research for this study several areas for improvement have been uncovered. Basically, these improvements are indicated in the areas of the constraints and the variables included in the model.

In conclusion, there are two areas that could justify further research concerning this model. The decomposition procedure mentioned in Chapter II is the first one of these areas. Bradley and Crane [5] briefly discuss this technique for solving LP problems. The simplifying and time-saving aspects of the decomposition technique seem to be especially applicable to this model. Lastly, research into the area of direct-access systems is needed. A direct-access application would greatly simplify the changing and updating of the model. One such

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system is discussed in an article by Thomas P. Gerrity, Jr. [18].
Before implementation of the model as a portfolio management tool,
research in these areas should be conducted.

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APPENDIXES

# APPENDIX A

## THE MODEL

### Purpose

The objective of the model is to minimize the total interest cost
for a thirteen-month period subject to constraining equations which
express management policy with respect to growth, turnover, and liq-
uidity of the CD portfolio.  The variables of the model are dollar
amounts of CD sales for each instrument-maturity-month.  The constraints
are linear equations of these variables.

### Structual Variables

The model contains a separate variable for each of the thirteen-
months, type of CD, and maturity period, in addition to variables repre-
senting the beginning balances for each type of CD and maturity period.
These variables comprise the objective function and the constraints of
the model.

### Constraints

Seventy Percent Rule.  These constraints reflect management policy
that sales in any period plus the previous month's balance must be
greater than or equal to seventy percent of the total dollars trans-
acted in that period.

Thirty Percent Rule. These constraint equations assure that management's policy of maintaining at least thirty percent of all instruments issued as national market instruments (type-6) is achieved in the model's solution.

Balanced Distribution. Management would like to have a more even distribution of maturity instruments for each type in the future periods of the planning horizon. This policy is reflected in constraints that restrict the amounts outstanding in each maturity period for a particular month from being less than or exceeding certain percentages of the total amount outstanding during that month.

## Accumulators

The model also contains equations which provide the total sales for each month, total sales for each instrument sold during each month, the total payout of maturing instruments during each month, and the total net amount outstanding during any month. These accumulators are included for use in constructing the constraints discussed above and certain bounds on the variables of the model.

## Bounds on Variables

In order to reflect management's policies of growth in amounts of instruments issued and restrictions concerning certain maturity periods of some instruments, upper and lower bounds were included for some of the variables of the model. First, a lower bound of $130 million was placed on the total net amount outstanding during any month. This reflects management policy concerning the growth of the CD portfolio. Lastly, management stated that during the planning horizon no special

market (type-8) instruments would be issued.  Therefore, the variables representing sales of type-8 CD's were set equal to zero.

## Interest Costs

Interest costs were computed for each of the structual variables by multiplying the forecasted annual interest rate by a factor representing the fraction of 365 days for which interest is paid on the instrument. These interest costs were then used as the coefficients of the decision variables in the objective function of the LP problem.  The model minimizes the total of these interest costs over the planning horizon.

## Abbreviated Example

Because of the large number of variables (567) included in the model, only an illustrative example will be presented here.

$$\text{Minimize Cost} = .10(x) + .05(y)$$

$$\begin{aligned} \text{Subject to:} \quad & x + y \leq 100 \text{ million} \\ & y \geq .33(x) \\ & x \geq 30 \text{ million} \end{aligned}$$

APPENDIX B

All of the modifications to the Harris model presented in the paper were programmed and solved for use with the IBM Mathematical Programming System Extended (MPSX) on the IBM Model 360/65 computer located at Oklahoma State University. If the resulting model is to be used on another model computer or at another installation, some control cards may have to be changed.

Also, the changes made to the model make use of a feature of MPSX known as READCOMM. This feature allows the programmer to augment the MPSX procedure with a FORTRAN program to output selected data of the MPSX solution in different types of formats. (It should also be noted that other features utilizing programming languages other than FORTRAN might have also been used[1].) The use of the special features of MPSX necessitates certain changes in the MPSX Control Program and the addition of a program to the model. These changes will be discussed in the sections that follow.

## Control Program

The MPSX Control Program (Exhibit I) provides the initialization and setup of the data storage areas to be used in solving the LP problem. Also, the control program inputs the data, calls for a solution routine, and provides various output listings as requested by the programmer. Two changes were necessary in this program to facilitate the use of the READCOMM feature.

```
            PROGRAM('ND')
*
*
            TITLE ('LIBERTY NATIONAL BANK CERTIFICATES OF DEPOSIT')
*
*
*
*           INITIALIZE ALL INPUT FILES
*
            INITIALZ
*
*
*           SETUP WORK FILES FOR INPUT OF DATA
*
            MOVE(XDATA,'CDEZZ')
            MOVE(XPBNAME,'PBFILE')
*
*
*           SETUP READCOMM FILE FOR USE WITH FORTRAN PROGRAM
*
            ASSIGN('COMMFMT','FT04F001','COMM')
            PREPOUT('COMMFMT')
*
*
*           CONVERT INPUT DATA TO INTERNAL STORAGE FORMAT
*
            CONVERT('SUMMARY')
            SETUP('BOUNDS','DOLRS')
            MOVE(XOBJ,'COST')
            MOVE(XRHS,'RHS')
   c        LIST INPUT DATA
            TITLE ('LIBERTY NATIONAL BANK -- INPUT DATA')
   c
            BCDOUT
   c
   c
            TITLE ('LIBERTY NATIONAL BANK -- SOLUTION')
   c
   c        SOLVE PROBLEM USING THE DUAL SOLUTION METHOD
   :
            DUAL
            SOLUTION
   c
   :        SETUP EDITIED DATA FOR READCOMM FILE
   :
            SOLUTION('FILE','COMMFMT','RSECTION','2','CSECTION','2/4/5',   1
  RMASKS','  ','CMASKS','***A','***B','***C','***D','***E','**PO',        2
  ***ANET','***BNET','***CNET','***DNET','***ENET','BAL*A','BAL*B',       3
  BAL*C','BAL*D','BAL*E','**SAL','**NET','  ')
   :
   :        DETERMINE RANGES FOR VARIABLES FOR SOLUTION TO REMAIN OPTIMAL
            TITLE ('LIBERTY NATIONAL BANK -- VARIABLE RANGES')
            RANGE

            BEGIN EDITING OF SOLUTION

            FREECORE
            MGMTFORM
            EXIT
            PEND
```

Exhibit I.  MPSX Control Program

The first change is the addition of the ASSIGN statement. This statement prepares an additional storage area to be used by the READCOMM routine. The storage area is a file used to store the selected MPSX solution variables until the FORTRAN program is executed.

Second, an additional SOLUTION statement was added. Within this statement a selection list causes the applicable variables of the MPSX solution set to be stored in the READCOMM file discussed above. After execution of the MPSX program, the FORTRAN program accesses the READCOMM file for use in obtaining the desired output format.

## Output FORTRAN Program

This section of the model contains the program written to output the MPSX variables in the management report form. Exhibit II is the FORTRAN program used in the report generating model.

MANAGEMENT OUTPUT FORM
******** *************


***************************************************************************************


PURPOSE:

THIS PROGRAM IS DESIGNED TO EDIT AND OUTPUT SELECTED INFORMATION FROM
THE COMPUTED SOLUTION OF THE CERTIFICATE OF DEPOSIT PREDICTION MODEL
WRITTEN BY LESTER HARRIS, GRADUATE OF OKLAHOMA STATE UNIVERSITY. THE
HARRIS MODEL PREDICTS THE OPTIMAL AMOUNTS OF THREE TYPES OF SHORT-TERM
CERTIFICATES OF DEPOSIT SALES FOR THE NEXT THIRTEEN MONTHS. THREE
FORMATS ARE USED TO EDIT THE MODEL SOLUTION:
     (1)   MATURITY DATE ANALYSIS - FOR EACH MONTH PREDICTED BY THE
           MODEL, THE AMOUNTS OF CERTIFICATES MATURING IN THE FUTURE
           MONTHS ARE PROVIDED
     (2)   PREDICTED SALES - THIS SECTION PROVIDES THE MODEL PREDICTED
           SALES FOR THE NEXT THIRTEEN MONTHS BY MATURITY PERIOD
     (3)   SUMMARY TOTALS - THIS SECTION PROVIDES THE TOTAL MONTHLY
           SALES, MONTHLY PAYOUT, AND THE NET AMOUNT OUTSTANDING FOR THE
           PREDICTED MONTHS.
THE PROGRAM IS DESIGNED TO BE GENERAL IN NATURE TO FACILITATE ITS USE
ANY THIRTEEN MONTH PERIOD WITH A MINIMUM OF VARIABLE CHANGES. THE
REQUIRED CHANGES ARE NOTED BY ** IN THE VARIABLE DEFINITION SECTION
WHICH FOLLOWS.


----------------------------------------------------------------------------


VARIABLE DEFINITION:

       ACCO -- ACCUMULATED INTEREST PAID EACH MONTH ON TYPE O CD'S.
       ACC6 -- ACCUMULATED INTEREST PAID EACH MONTH ON TYPE 6 CD'S.
       ACC8 -- ACCUMULATED INTEREST PAID EACH MONTH ON TYPE 8 CD'S.
       AMTNET -- TOTAL NET AMOUNT OUTSTANDING EACH MONTH.
       ATOTAL -- TOTAL OF ACCUMULATED INTEREST PAID FOR EACH TYPE CD.
       BAL -- BEGINNING BALANCES FOR EACH TYPE CD AND MATURITY PERIOD.
**     BEGIN -- THE NAME OF THE BEGINNING MONTH OF THE MODEL.
       COL -- USED TO STORE THE COLUMN NAME OF THE MODEL SOLUTION.
       COST -- INTEREST COST PER MONTH.
       DAYS -- MATURITY PERIOD.
**     ENDING -- THE NAME OF THE ENDING MONTH OF THE MODEL.
       FILE -- FILE DESIGNATOR OF THE STORED SOLUTION.
       HEAD1, HEAD2, HEAD3, HEAD4 -- OUTPUT HEADINGS.
       INDIC -- INDICATOR OF END OF THE FILE USED FOR OUTPUT.
       INDICES: PROGRAM COUNTERS
        I, IEND, IJ, INDX, IROW, IX, IY, JK, KOUNT1, LL, LOOP, LP, LINX
**     KNT -- NUMBER OF THE BEGINNING MONTH OF THE MODEL.
       MONTH -- THE CURRENT MONTH BEING PREDICTED.
       NAME -- THE NAME OF EACH SOLUTION STORED ON THE FILE.
       PAYOUT -- TOTAL AMOUNT PAID OUT EACH MONTH.
       SALES -- TOTAL SALES EACH MONTH.
       SUM -- SUMMARY TOTAL SALES, PAYOUT, AND NET AMOUNT OUTSTANDING.

Exhibit II. FORTRAN Program

```
      TOTAL -- ACCUMULATED SALES FOR EACH OF THE THIRTEEN MONTHS.
      TYOMAT -- MATURITY DATA FOR TYPE O CD'S.
      TY6MAT -- MATURITY DATA FOR TYPE 6 CD'S.
      TY8MAT -- MATURITY DATA FOR TYPE 8 CD'S.
      TYPEO -- PLOT DATA OF TYPE O SALES.
      TYPE6 -- PLOT DATA OF TYPE 6 SALES.
      TYPE8 -- PLOT DATA OF TYPE 8 SALES.
      VAL -- PREDICTED DATA FOR EACH MONTH BY MATURITY PERIOD.
      VALUES -- FILED SOLUTION VALUES.
      WAIR -- WEIGHTED AVERAGE INTEREST RATE.
      XDATA -- PLOT DATA FOR EACH MONTH.
      YR -- YEAR OR YEARS INCLUDED IN THE MODEL PREDICTIONS.


:********************************************************************************


      SETUP DATA STORAGE AREA TO BE USED BY PROGRAM

   INTEGER HEAD1(12),HEAD2(12),HEAD3(12),HEAD4(6),BEGIN(4),ENDING(4)

   INTEGER DAYS,FILE,MONTH(30),YR(30)

   DOUBLE PRECISION NAME,COL(10),VALUES(3)

   DOUBLE PRECISION  VAL(65,9),BAL(15),SUM(13,3),TOTAL(3),FACTOR(5)

   DOUBLE PRECISION  TYOMAT(19,3),TY6MAT(19,3),TY8MAT(19,3)

   DOUBLE PRECISION  ACCO(19),ACC6(19),ACC8(19),ATOTAL(3),WAIR(3)

   DIMENSION  TYPEO(15),TYPE6(15),TYPE8(15),COST(15),XDATA(15)

   DIMENSION XPLOT(4),SALES(15),PAYOUT(15),AMTNET(15)


          DATA  INITIALIZATION


   DATA   HEAD1/11*4H****,4H*   /, IOUT/6/, FILE/4/,
  A HEAD2/2*4H****,4H**  ,4HLIBE,4HRTY ,4HNATI,4HOVAL,4H BAN,
  B       4HK  *,2*4H****,4H*   /,
  C HEAD3/4H****,4H*  C,4HERTI,4HFICA,4HTE O,4HF DE,4HPOSI,4HT SC,
  D       4HHEDU,4HLE  ,4H****,4H*   /,
  E HEAD4/6*4H****/,
  H.BEGIN/4H  DE,4HCEMB,4HER  ,4H1974/,
  I ENDING/4H DEC,4HEMBE,4HR 19,4H75 /,
  J TYPEO/15*0.0/, TYPE6/15*0.0/, TYPE8/15*0.0/,KOUNT1/0/,
  K XDATA/1.0,2.0,3.0,4.0,5.0,6.0,7.0,8.0,9.0,10.0,11.0,12.0,13.0,
  L       14.0,15.0/, COST/15*0.0/

   DATA MONTH/4H JAN,4H FEB,4H MAR,4H APR,4H MAY,4H JUN,4H JUL,
  1   4H AUG,4H SEP,4H OCT,4H NOV,4H DEC,4H JAN,4H FEB,4H MAR,4H APR,
  2   4H MAY,4H JUN,4H JUL,4H AUG,4H SEP,4H OCT,4H NOV,4H DEC,4H JAN,
  3   4H FEB,4H MAR,4H APR,4H MAY,4H JUN/

   DATA YR/ 12*74,12*75,6*76/,ATOTAL/3*0.0/
```

Exhibit II.  (Continued)

```
      DATA ACCO/19*0.0/,ACC6/19*0.0/,ACC8/19*0.0/

      DATA TYOMAT/57*0.0/,TY6MAT/57*0.0/,TY8MAT/57*0.0/

         FACTOR(1) = 365./30.
         FACTOR(2) = 365./60.
         FACTOR(3) = 365./90.
         FACTOR(4) = 365./120.
         FACTOR(5) = 365./180.

                  MAIN HEADINGS


      WRITE (IOUT,100) HEAD1,HEAD2,HEAD3,BEGIN,ENDING,HEAD1


            OBTAIN INPUT DATA FROM 'READCOMM'


         POSITION FILE TO THE BEGINNING

      CALL POSITN (FILE,INDIC)
      CALL ARRAY (FILE,INDIC,NAME,NRCOL)

         POSITION TO THE COLUMN SECTION OF THE FILE

   10 CALL ARRAY (FILE,INDIC,NAME,NRCOL)
      IF (INDIC - 1) 90,90,11

         INPUT THE BEGINNING BALANCES FOR EACH TYPE CD AND MATURITY
         PERIOD AND COMPUTE THE ASSOCIATED COST AND MATURITY DATE

   11 DO 20 LL = 1,15
         CALL VECTOR (FILE,INDIC,VALUES)
         IF (INDIC - 1) 10,10,12
   12    GO TO (13,13,13,13,14,15,15,15,15,16,17,17,17,17,18),LL
   13    TYOMAT(LL,1) = TYOMAT(LL,1) + VALUES(2)
         ACCO(LL) = ACCO(LL) + VALUES(2)*VALUES(3)*FACTOR(LL)
         COST(LL) = COST(LL) + VALUES(2) * VALUES(3)
         GO TO 19
   14    TYOMAT(LL+1,1) = TYOMAT(LL+1,1) + VALUES(2)
         ACCO(LL+1) = ACCO(LL+1) + VALUES(2)*VALUES(3)*FACTOR(LL)
         COST(LL+1) = COST(LL+1) + VALUES(2) * VALUES(3)
         GO TO 19
   15    TY6MAT(LL-5,1) = TY6MAT(LL-5,1) + VALUES(2)
         ACC6(LL-5) = ACC6(LL-5) + VALUES(2)*VALUES(3)*FACTOR(LL-5)
         COST(LL-5) = COST(LL-5) + VALUES(2) * VALUES(3)
         GO TO 19
   16    TY6MAT(LL-4,1) = TY6MAT(LL-4,1) + VALUES(2)
         ACC6(LL-4) = ACC6(LL-4) + VALUES(3)*VALUES(2)*FACTOR(LL-5)
         COST(LL-4) = COST(LL-4) + VALUES(2) * VALUES(3)
         GO TO 19
   17    TY8MAT(LL-10,1) = TY8MAT(LL-10,1) + VALUES(2)
         ACC8(LL-10) = ACC8(LL-10)+VALUES(2)*VALUES(3)*FACTOR(LL-10)
         COST(LL-10) = COST(LL-10) + VALUES(2) * VALUES(3)
         GO TO 19
   18    TY8MAT(LL-9,1) = TY8MAT(LL-9,1) + VALUES(2)
         ACC8(LL-9) = ACC8(LL-9) + VALUES(2)*VALUES(3)*FACTOR(LL-10)
```

Exhibit II. (Continued)

```
        COST(LL-9) = COST(LL-9) + VALUES(3) * VALUES(2)
  19    BAL(LL) = VALUES(2)
  20    CONTINUE

     DO 7000 I = 1,13

        SETUP COUNTERS TO BEGIN INPUT OF MONTHLY DATA

        IROW = KOUNT1 + 1
        IEND = KOUNT1 + 53
        LP = 0
        JK = I

        DO 3000 LOOP = IROW,IEND,13
           LP = LP + 1
           JK = JK + 1

        INPUT MONTHLY DATA AND COMPUTE THE ASSOCIATED COST AND MATURITY
        DATE

           DO 2000 INDX = 1,7,3
              CALL VECTOR (FILE,INDIC,VALUES)
              IF (INDIC - 1) 10,10,30
  30          IF (LP .EQ. 5) JK=JK+1
              IF (INDX - 4) 31,32,33
  31          TYPEO(I) = TYPEO(I) + VALUES(2)
              TYOMAT(JK,1) = TYOMAT(JK,1) + VALUES(2)
              ACCO(JK) = ACCO(JK) + VALUES(2)*VALUES(3)*FACTOR(LP)
              GO TO 34
  32          TYPE6(I) = TYPE6(I) + VALUES(2)
              TY6MAT(JK,1) = TY6MAT(JK,1) + VALUES(2)
              ACC6(JK) = ACC6(JK) + VALUES(2)*VALUES(3)*FACTOR(LP)
              GO TO 34
  33          TYPE8(I) = TYPE8(I) + VALUES(2)
              TY8MAT(JK,1) = TY8MAT(JK,1) + VALUES(2)
              ACC8(JK) = ACC8(JK) + VALUES(2)*VALUES(3)*FACTOR(LP)
  34          VAL(LOOP,INDX) = VALUES(2)
              VAL(LOOP,INDX+1) = VALUES(3) * FACTOR(LP) * 100.0
              COST(JK) = COST(JK) + VALUES(2) * VALUES(3)
2000       CONTINUE
3000    CONTINUE

        INPUT SUMMARY TOTALS FOR EACH MONTH

        DO 4000 LP = 1,3
           CALL VECTOR (FILE,INDIC,VALUES)
           IF (INDIC - 1) 10,10,35
  35       SUM(I,LP) = VALUES(2)
4000    CONTINUE

        INPUT THE NET AMOUNT OUTSTANDING FOR EACH MONTH

        DO 6000 LOOP = 3,9,3
           DO 5000 INDX = IROW,IEND,13
              CALL VECTOR (FILE,INDIC,VALUES)
              IF (INDIC - 1) 10,10,36
  36          VAL(INDX,LOOP) = VALUES(2)
5000       CONTINUE
```

Exhibit II. (Continued)

```
6000    CONTINUE
        KOUNT1 = KOUNT1 + 1

        RE-INITIALIZE THE TOTALS STORAGE AREAS

      DO 8025 IY= 1,3
        TOTAL(IY) = 0.0
        ATOTAL(IY) = 0.0
8025 CONTINUE
      GO TO (47,48,47,48,47,48,47,48,47,48,47,48,47), I

        WRITE HEADINGS  FOR THE MATURITY DATE OUTPUT SECTION

  47 WRITE (IOUT,111)
     WRITE (IOUT,112)
  48 KNT = I + 11
     WRITE (IOUT,116) MONTH(KNT),YR(KNT),HEAD4
     IX = I
     ND = IX + 6
     LINX = 1

        ACCUMULATE THE TOTALS FOR THE MATURITY DATE OUTPUT

     DO 8050 IY = IX,ND
        TOTAL(1) = TOTAL(1) + TYOMAT(IY,1)
        TOTAL(2) = TOTAL(2) + TY6MAT(IY,1)
        TOTAL(3) = TOTAL(3) + TY8MAT(IY,1)
        ATOTAL(1) = ATOTAL(1) + ACCO(IY)
        ATOTAL(2) = ATOTAL(2) + ACC6(IY)
        ATOTAL(3) = ATOTAL(3) + ACC8(IY)
8050 CONTINUE

        COMPUTE THE WEIGHTED AVERAGE INTEREST RATE FOR THE TOTALS OJTPJT

     DO 8075 IY = 1,3
        IF (TOTAL(IY) .LE. 1.0) GO TO 88
        WAIR(IY) = ATOTAL(IY) / TOTAL(IY) * 100.0
        GO TO 8075
  88    WAIR(IY) = 0.0
8075 CONTINUE

        COMPUTE THE PERCENT OF TOTAL AMOUNT AND THE WEIGHTED AVERAGE
        INTEREST RATE FOR EACH MONTH

     DO 6075 IJ = IX,ND
        IF (TOTAL(1) .LE. 1.0) GO TO 54
        TYOMAT(IJ,2) = TYOMAT(IJ,1) / TOTAL(1) * 100.0
  49    IF (TOTAL(2) .LE. 1.0) GO TO 55
        TY6MAT(IJ,2) = TY6MAT(IJ,1) / TOTAL(2) * 100.0
  50    IF (TOTAL(3) .LE. 1.0) GO TO 56
        TY8MAT(IJ,2) = TY8MAT(IJ,1) / TOTAL(3) * 100.0
  51    IF (TYOMAT(IJ,1) .LE. 1.0) GO TO 57
        TYOMAT(IJ,3) = ACCO(IJ) / TYOMAT(IJ,1) * 100.0
  52    IF (TY6MAT(IJ,1) .LE. 1.0) GO TO 58
        TY6MAT(IJ,3) = ACC6(IJ) / TY6MAT(IJ,1) * 100.0
  53    IF (TY8MAT(IJ,1) .LE. 1.0) GO TO 59
        TY8MAT(IJ,3) = ACC8(IJ) / TY8MAT(IJ,1) * 100.0
        GO TO 60
```

Exhibit II.  (Continued)

```
54      TYOMAT(IJ,2) = 0.0
        GO TO 49
55      TY6MAT(IJ,2) = 0.0
        GO TO 50
56      TY8MAT(IJ,2) = 0.0
        GO TO 51
57      TYOMAT(IJ,3) = 0.0
        GO TO 52
58      TY6MAT(IJ,3) = 0.0
        GO TO 53
59      TY8MAT(IJ,3) = 0.0
60      IF (LINX - 1) 61,61,62

        WRITE THE MONTHLY MATURITY DATE FIGURES

61      WRITE(IOUT,113)MONTH(KNT),YR(KNT),(TYOMAT(IJ,J),J=1,3),
   1         (TY6MAT(IJ,J),J=1,3),(TY8MAT(IJ,J),J=1,3)
        GO TO 63
62      WRITE(IOUT,114)MONTH(KNT),YR(KNT),(TYOMAT(IJ,J),J=1,3),
   1         (TY6MAT(IJ,J),J=1,3),(TY8MAT(IJ,J),J=1,3)
63      KNT = KNT + 1
        LINX = 2
6075 CONTINUE

        WRITE THE TOTAL FIGURES FOR THE MATURITY DATE OUTPUT

        WRITE (IOUT,115) (TOTAL(IY),WAIR(IY),IY=1,3)
7000 CONTINUE

        INCREMENT THE COUNTERS

        IROW = 1
        IEND = 13
        DAYS = 30
        DO 8000 INDX = 1,5
           IF (INDX .EQ. 5) DAYS = 180

        WRITE THE HEADINGS FOR THE PREDICTED MONTHLY SALES OUTPUT

        WRITE (IOUT,101) HEAD4,DAYS,HEAD4
        WRITE (IOUT,102)
        WRITE (IOUT,103) BAL(INDX),BAL(INDX+5),BAL(INDX+10)
        WRITE (IOUT,104)
        DO 7025 LOOP = 1,3
           TOTAL(LOOP) = 0.0
7025    CONTINUE
        KNT = 12
        LINX = 1
        DO 7050 LOOP = IROW,IEND
           IF (LINX - 1) 37,37,38

        WRITE THE MONTHLY FIGURES, ACCUMULATE THE TOTALS, AND INCREMENT
        THE COUNTERS

37         WRITE (IOUT,105) MONTH(KNT),YR(KNT),(VAL(LOOP,II),II=1,9)
           GO TO 39
38         WRITE (IOUT,106) MONTH(KNT),YR(KNT),(VAL(LOOP,II),II=1,9)
39         TOTAL(1) = TOTAL(1) + VAL(LOOP,1)
```

Exhibit II.  (Continued)

```
            TOTAL(2) = TOTAL(2) + VAL(LOOP,4)
            TOTAL(3) = TOTAL(3) + VAL(LOOP,7)
            LINX = LINX + 1
            KNT = KNT + 1
7050    CONTINUE

               OUTPUT TOTALS

        WRITE (IOUT,107) TOTAL
        DAYS = DAYS + 30
        IROW = IROW + 13
        IEND = IEND + 13
8000 CONTINUE

        WRITE THE SUMMARY TOTALS FOR THE MODEL

        KNT = 12
        WRITE (IOUT,108)
        WRITE (IOUT,109)MONTH(KNT),YR(KNT),(SUM(1,I),I=1,3)
        WRITE(IOUT,110)(MONTH(KNT+I),YR(KNT+I),(SUM(I,J),J=1,3),I=1,12)


     SET UP THE PLOT DATA FOR THE SUMMARY TOTALS

        CALL PLOTS
        CALL PLOTC (0.,-11.0,-3)
        CALL SCALE (XDATA,12.0,13,1)


        DO 9025 KK = 1,13
            SALES(KK) = SUM(KK,1)
            PAYOUT(KK) = SUM(KK,2)
            AMTNET(KK) = SUM(KK,3)
9025 CONTINUE

        XPLOT(1) = AMIN1(SALES,PAYOUT,AMTNET)
        XPLOT(2) = AMAX1(SALES,PAYOUT,AMTNET)

        CALL PLOTC (0.0,1.5,-3)
        CALL SCALE (XPLOT,8.0,2,1)

        SALES(14) = XPLOT(3)
        PAYOUT(14) = XPLOT(3)
        AMTNET(14) = XPLOT(3)
        SALES(15) = XPLOT(4)
        PAYOUT(15) = XPLOT(4)
        AMTNET(15) = XPLOT(4)

        CALL AXIS( 0.0,0.0,'MONTH',-5,12.0,0.0,XDATA(14),XDATA(15))
        CALL AXIS (0.0,0.0,'TOTALS',6,8.0,90.0,SALES(14),SALES(15))

        CALL LINE (XDATA,SALES,13,1,1,3)
        CALL LINE (XDATA,PAYOUT,13,1,1,11)
        CALL LINE (XDATA,AMTNET,13,1,1,1)

        CALL SYMBOL(3.0,8.25,.35,'SUMMARY TOTALS',0.0,14)
        CALL SYMBOL(10.0,8.0,.21,'LEGEND',0.0,6)
        CALL SYMBOL(10.0,7.75,.14,3,0.0,-1)
```

Exhibit II.  (Continued)

```
      CALL SYMBOL(999.0,999.0,.14,'   SALES',0.0,7)
      CALL SYMBOL(10.0,7.5 ,.14,11,0.0,-1)
      CALL SYMBOL(999.0,999.0,.14,'   PAYOUT',0.0,8)
      CALL SYMBOL(10.0,7.25,.14,1,0.0,-1)
      CALL SYMBOL(999.0,999.0,.14,'   NET AMOUNT',0.0,12)

   SET UP THE PLOT DATA FOR THE PROJECTED SALES

      TYPEO(14) = 0.0
      TYPEO(15) = 15000.0
      TYPE6(14) = 0.0
      TYPE6(15) = 15000.0
      SALES(14) = 0.0
      SALES(15) = 15000.0

      CALL PLOTC (15.0,0.0,-3)
      CALL AXIS (0.0,0.0,'MONTH',-5,12.0,0.0,XDATA(14),XDATA(15))
      CALL AXIS(0.0,0.0,'SALES TOTALS',12,8.0,90.0,TYPEO(14),TYPEO(15))

      CALL LINE (XDATA,TYPEO,13,1,1,3)
      CALL LINE (XDATA,TYPE6,13,1,1,11)
      CALL LINE (XDATA,SALES,13,1,1,1)

      CALL SYMBOL(3.5,8.25,.35,'SALES TOTALS',0.0,12)
      CALL SYMBOL(10.0,7.75,.21,'LEGEND',0.0,6)
      CALL SYMBOL(10.0,7.25,.14,3,0.0,-1)
      CALL SYMBOL(999.0,999.0,.14,'   TYPE 0 SALES',0.0,14)
      CALL SYMBOL(10.0,7.0 ,.14,11,0.0,-1)
      CALL SYMBOL(999.0,999.0,.14,'   TYPE 6 SALES',0.0,14)
      CALL SYMBOL(10.0,6.75,.14,1,0.0,-1)
      CALL SYMBOL(999.0,999.0,.14,'   TOTAL SALES',0.0,13)

   SET UP THE DATA FOR THE COST TOTALS PLOT

      CALL PLOTC (15.0,0.0,-3)
      CALL SCALE (COST, 8.0,13,1)

      CALL AXIS( 0.0,0.0,'MONTH',-5,12.0,0.0,XDATA(14),XDATA(15))
      CALL AXIS(0.0,0.0,'COST',4, 8.0,90.0,COST(14),COST(15))

      CALL LINE (XDATA,COST ,13,1,1,3)

      CALL SYMBOL(5.0,8.25,.35,'COST TOTALS',0.0,11)
      CALL PLOTC (15.0,0.0,-3)


            OUTPUT FORMATS


  100 FORMAT (1H1/1H0/1H0/1H0/1H0/1H0/1H0/1H0/1H0/1H0/1H0/1H0/1H0/,
     1    44X,12A4/1H0,43X,12A4/1H0,43X,12A4/1H0,
     2    43X,'**',4A4,' THROUGH ',4A4,'**'/1H0,43X,12A4)

  101 FORMAT(1H1,56X,'LIBERTY NATIONAL BANK'//1H0,37X,'PREDICTED CERTIFI
     1CATES OF DEPOSIT SALES BY MATURITY PERIOD'/1H0,54X,6A4/1H0,58X,I3,
     2' DAY MATURITY'/1H0,54X,6A4)

  102 FORMAT(1H0,53X,'(DOLLAR AMOUNTS IN THOUSANDS)'/1H0/1H0,27X,
```

Exhibit II.  (Continued)

```
      1    'TYPE 0',36X,'TYPE 6',36X,'TYPE 8'/1H0,13X,
      2    '*****************************************',8X,
      3    '*****************************************',8X,
      4    '*****************************************')

  103 FORMAT (1H ,15X,'BEGINNING BALANCE  $',F10.2,12X,
      1    'BEGINNING BALANCE  $',F10.2,12X,'BEGINNING BALANCE  $',F10.2)

  104 FORMAT(1H0/1H ,15X,'CURRENT',5X,'INTST',5X,'NET AMOUNT',10X,
      1 'CURRENT',5X,'INTST',5X,'NET AMOUNT',10X,'CURRENT',5X,'INTST',
      2 5X,'NET AMOUNT'/1H ,' MONTH',10X,'SALES',7X,'RATE',4X,
      3 'OUTSTANDING',11X,'SALES ',7X,'RATE',4X,'OUTSTANDING',11X,'SALES',
      4 7X,'RATE',4X,'OUTSTANDING'/1H+,' _____',10X,'_____',6X,'_____',
      5 4X,'_____',11X,'_____',6X,'_____',4X,'_____',11X,
      6 '_____',6X,'_____',4X,'_____')

  105 FORMAT (1H0,A4,I3,6X,'$',F9.2,3X,F6.3,5X,'$',F9.2,8X,'$',F9.2,3X,
      1 F6.3,5X,'$',F9.2,8X,'$',F9.2,3X,F6.3,5X,'$',F9.2)

  106 FORMAT (1H0,A4,I3,7X,F9.2,3X,F6.3,6X,F9.2,9X,F9.2,3X,F6.3,6X,
      4 F9.2,9X,F9.2,3X,F6.3,6X,F9.2)

  107 FORMAT (1H ,13X,'----------',32X,'----------',32X,'----------',
      1 /1H 13X,'$',F9.2,32X,'$',F9.2,32X,'$',F9.2)

  108 FORMAT(1H1,56X,'LIBERTY NATIONAL BANK'//1H0,55X,'SUMMARY TOTALS BY
      1 MONTH'//1H0,52X,'(DOLLAR AMOUNTS IN THOUSANDS)'//1H0,95X,
      2'NET AMOUNT'/1H ,25X,'MONTH',15X,'MONTHLY SALES',11X,
      3'MONTHLY PAYOUT',11X,'OUTSTANDING'/1H+,25X,'_____',15X,
      4'_____ _____',11X,'_____ _____',11X,'_____')

  109 FORMAT(1H0,23X,A4,I3,16X,'$',F9.2,15X,'$',F9.2,13X,'$',F9.2)

  110 FORMAT(1H0,23X,A4,I3,17X,F9.2,16X,F9.2,14X,F9.2)

  111 FORMAT(1H1,56X,'LIBERTY NATIONAL BANK'//1H0,38X,'MATURITY DATE ANA
      1LYSIS BY TYPE OF CERTIFICATES OF DEPOSIT' /1H ,52X,'(DOLLAR AMOUNT
      2S IN THOUSANDS)'//1H0,27X,'TYPE 0',36X,'TYPE 6',36X,'TYPE 8',/1H ,
      313X,'*****************************************',8X,'****************
      4***********',8X,'*****************************************')

  112 FORMAT(1H       ,14X,'CERT AMTS    PCT OF    WGHTD AVG',10X,
      1'CERT AMTS    PCT OF    WGHTD AVG',10X,'CERT AMTS    PCT OF    WGH
      2TD AVG'/1H ,' MONTH',8X,'MATURING    TOT AMT   INTST RATE',9X,
      3'MATURING    TOT AMT   INTST RATE',9X,'MATURING    TOT AMT    INT
      4ST RATE')

  113 FORMAT(1H0,A4,I3,6X,'$',F10.2,4X,F6.2,4X,F8.4,9X,'$',F10.2,4X,
      1 F6.2,4X,F8.4,9X,'$',F10.2,4X,F6.2,4X,F8.4)

  114 FORMAT(1H0,A4,I3,7X,F10.2,4X,F6.2,4X,F8.4,10X,F10.2,4X,F6.2,4X,
      1 F8.4,10X,F10.2,4X,F6.2,4X,F8.4)

  115 FORMAT(1H0/1H0,'TOTALS',6X,'$',F11.2,15X,F7.4,8X,'$',F11.2,15X,
      1  F7.4,8X,'$',F11.2,15X,F7.4)

  116 FORMAT(1H0/1H0, 7X,A4,' 19',I2/1H ,6A4)
   90 RETURN
```

Exhibit II.  (Continued)

FOOTNOTE

[1]MPS also allows the solution to be stored in STANDARD FORMAT for
use with the Programming Language 1 (PL/1) or Common Business Oriented
Language (COBOL).  However, these languages were unfamiliar to the
programmer.  Also, the STANDARD FORMAT feature is not as versatile as
the READCOMM feature in that editing of the solution is not permitted.
(See the IBM MPS/360, Linear and Separable Programming-User's Manual,
reference [25].)

APPENDIX C

REPORTS FOR THE PERIOD

DECEMBER, 1974 to DECEMBER, 1975

LIBERTY NATIONAL BANK

MATURITY DATE ANALYSIS BY TYPE OF CERTIFICATES OF DEPOSIT
(DOLLAR AMOUNTS IN THOUSANDS)

| | TYPE 0 | | | TYPE 6 | | | TYPE 8 | | |
|---|---|---|---|---|---|---|---|---|---|
| MONTH | CERT AMTS MATURING | PCT OF TOT AMT | WGHTD AVG INTST RATE | CERT AMTS MATURING | PCT OF TOT AMT | WGHTD AVG INTST RATE | CERT AMTS MATURING | PCT OF TOT AMT | WGHTD AVG INTST RATE |
| **DEC 1974** | | | | | | | | | |
| DEC 74 | $ 13770.10 | 13.14 | 10.6714 | $ 2000.00 | 5.39 | 11.8503 | $ 0.0 | 0.0 | 0.0 |
| JAN 75 | 39217.52 | 37.43 | 10.3660 | 17549.99 | 47.30 | 11.2315 | 0.0 | 0.0 | 0.0 |
| FEB 75 | 10832.48 | 10.34 | 10.8285 | 3900.00 | 10.51 | 10.9701 | 0.0 | 0.0 | 0.0 |
| MAR 75 | 20230.76 | 19.31 | 10.4795 | 9750.00 | 26.23 | 10.8401 | 0.0 | 0.0 | 0.0 |
| APR 75 | 7069.24 | 6.75 | 10.0001 | 3900.00 | 10.51 | 10.6799 | 0.0 | 0.0 | 0.0 |
| MAY 75 | 3447.84 | 3.29 | 10.0566 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| JUN 75 | 10202.16 | 9.74 | 9.8700 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| TOTALS | $ 104770.09 | | 10.3927 | $ 37099.99 | | 11.0765 | $ 0.0 | | 0.0 |
| **JAN 1975** | | | | | | | | | |
| JAN 75 | $ 39217.52 | 30.12 | 10.3660 | $ 17549.99 | 31.03 | 11.2315 | $ 0.0 | 0.0 | 0.0 |
| FEB 75 | 33880.75 | 26.02 | 10.2374 | 21450.00 | 37.93 | 10.9288 | 0.0 | 0.0 | 0.0 |
| MAR 75 | 36400.00 | 27.95 | 10.2353 | 9750.00 | 17.24 | 10.8401 | 0.0 | 0.0 | 0.0 |
| APR 75 | 7069.24 | 5.43 | 10.0001 | 3900.00 | 6.90 | 10.6799 | 0.0 | 0.0 | 0.0 |
| MAY 75 | 3447.84 | 2.65 | 10.0566 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| JUN 75 | 10202.16 | 7.83 | 9.8700 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| JUL 75 | 0.0 | 0.0 | 0.0 | 3900.00 | 6.90 | 10.5499 | 0.0 | 0.0 | 0.0 |
| TOTALS | $ 130217.50 | | 10.2291 | $ 56549.99 | | 10.9641 | $ 0.0 | | 0.0 |

# LIBERTY NATIONAL BANK

## MATURITY DATE ANALYSIS BY TYPE OF CERTIFICATES OF DEPOSIT
### (DOLLAR AMOUNTS IN THOUSANDS)

| MONTH | TYPE 0 CERT AMTS MATURING | PCT OF TOT AMT | WGHTD AVG INTST RATE | TYPE 6 CERT AMTS MATURING | PCT OF TOT AMT | WGHTD AVG INTST RATE | TYPE 8 CERT AMTS MATURING | PCT OF TOT AMT | WGHTD AVG INTST RATE |
|---|---|---|---|---|---|---|---|---|---|
| **FEB 1975** | | | | | | | | | |
| FEB 75 | $ 33880.75 | 27.13 | 10.2374 | $ 21450.00 | 35.48 | 10.9288 | $ 0.0 | 0.0 | 0.0 |
| MAR 75 | 63700.00 | 51.01 | 9.7788 | 25350.00 | 41.94 | 10.2983 | 0.0 | 0.0 | 0.0 |
| APR 75 | 13650.00 | 10.93 | 9.5855 | 9750.00 | 16.13 | 10.2299 | 0.0 | 0.0 | 0.0 |
| MAY 75 | 3447.84 | 2.76 | 10.0566 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| JUN 75 | 10202.16 | 8.17 | 9.8700 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| JUL 75 | 0.0 | 0.0 | 0.0 | 3900.00 | 6.45 | 10.5499 | 0.0 | 0.0 | 0.0 |
| AUG 75 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| TOTALS | $ 124880.74 | | 9.8972 | $ 60449.99 | | 10.5272 | $ 0.0 | | 0.0 |
| **MAR 1975** | | | | | | | | | |
| MAR 75 | $ 63700.00 | 41.18 | 9.7788 | $ 25350.00 | 39.39 | 10.2983 | $ 0.0 | 0.0 | 0.0 |
| APR 75 | 40950.00 | 26.47 | 8.6556 | 23400.00 | 36.36 | 9.5477 | 0.0 | 0.0 | 0.0 |
| MAY 75 | 17097.84 | 11.05 | 8.5426 | 5850.00 | 9.09 | 9.0301 | 0.0 | 0.0 | 0.0 |
| JUN 75 | 23852.16 | 15.42 | 8.8170 | 3900.00 | 6.06 | 8.8999 | 0.0 | 0.0 | 0.0 |
| JUL 75 | 9100.00 | 5.88 | 7.8700 | 5850.00 | 9.09 | 9.9466 | 0.0 | 0.0 | 0.0 |
| AUG 75 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| SEP 75 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| TOTALS | $ 154699.99 | | 9.0843 | $ 64350.00 | | 9.7933 | $ 0.0 | | 0.0 |

LIBERTY NATIONAL BANK

MATURITY DATE ANALYSIS BY TYPE OF CERTIFICATES OF DEPOSIT
(DOLLAR AMOUNTS IN THOUSANDS)

| | TYPE 0 | | | TYPE 6 | | | TYPE 8 | | |
|---|---|---|---|---|---|---|---|---|---|
| MONTH | CERT AMTS MATURING | PCT OF TOT AMT | WGHTD AVG INTST RATE | CERT AMTS MATURING | PCT OF TOT AMT | WGHTD AVG INTST RATE | CERT AMTS MATURING | PCT OF TOT AMT | WGHTD AVG INTST RATE |
| **APR 1975** | | | | | | | | | |
| APR 75 | $ 40950.00 | 31.03 | 8.6556 | $ 23400.00 | 38.71 | 9.5477 | $ 0.0 | 0.0 | 0.0 |
| MAY 75 | 44397.84 | 33.65 | 8.0366 | 17550.00 | 29.03 | 8.6432 | 0.0 | 0.0 | 0.0 |
| JUN 75 | 23852.16 | 18.08 | 8.8170 | 5850.00 | 9.68 | 8.7399 | 0.0 | 0.0 | 0.0 |
| JUL 75 | 18200.00 | 13.79 | 7.7150 | 9750.00 | 16.13 | 9.2839 | 0.0 | 0.0 | 0.0 |
| AUG 75 | 4550.00 | 3.45 | 7.4001 | 3900.00 | 6.45 | 8.1301 | 0.0 | 0.0 | 0.0 |
| SEP 75 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| OCT 75 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| TCTALS | $ 131949.98 | | 8.3035 | $ 60450.00 | | 9.0729 | $ 0.0 | | 0.0 |
| **MAY 1975** | | | | | | | | | |
| MAY 75 | $ 44397.84 | 32.79 | 8.0366 | $ 17550.00 | 31.03 | 8.6432 | $ 0.0 | 0.0 | 0.0 |
| JUN 75 | 37502.16 | 27.70 | 8.2613 | 11700.00 | 20.69 | 8.3947 | 0.0 | 0.0 | 0.0 |
| JUL 75 | 31850.00 | 23.52 | 7.5199 | 15600.00 | 27.59 | 8.8101 | 0.0 | 0.0 | 0.0 |
| AUG 75 | 4550.00 | 3.36 | 7.4001 | 3900.00 | 5.90 | 8.1301 | 0.0 | 0.0 | 0.0 |
| SEP 75 | 13650.00 | 10.08 | 6.9700 | 5850.00 | 10.34 | 7.7301 | 0.0 | 0.0 | 0.0 |
| OCT 75 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| NOV 75 | 3447.84 | 2.55 | 6.8401 | 1950.00 | 3.45 | 8.0000 | 0.0 | 0.0 | 0.0 |
| TOTALS | $ 135397.83 | | 7.8179 | $ 56550.00 | | 8.4858 | $ 0.0 | | 0.0 |

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LIBERTY NATIONAL BANK

MATURITY DATE ANALYSIS BY TYPE OF CERTIFICATES OF DEPOSIT
(DOLLAR AMOUNTS IN THOUSANDS)

| | TYPE 0 | | | TYPE 6 | | | TYPE 8 | | |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | ************************************ | | | ************************************ | | | ************************************ | | |
| MONTH | CERT AMTS MATURING | PCT OF TOT AMT | WGHTD AVG INTST RATE | CERT AMTS MATURING | PCT OF TOT AMT | WGHTD AVG INTST RATE | CERT AMTS MATURING | PCT OF TOT AMT | WGHTD AVG INTST RATE |
| **JUN 1975** | | | | | | | | | |
| ************************** | | | | | | | | | |
| JUN 75 | $ 37502.16 | 29.18 | 8.2613 | $ 11700.00 | 23.08 | 8.3947 | $ 0.0 | 0.0 | 0.0 |
| JUL 75 | 51152.15 | 39.81 | 7.4181 | 25350.00 | 50.00 | 8.4600 | 0.0 | 0.0 | 0.0 |
| AUG 75 | 7997.84 | 6.22 | 7.3223 | 3900.00 | 7.69 | 8.1301 | 0.0 | 0.0 | 0.0 |
| SEP 75 | 18200.00 | 14.16 | 7.0000 | 7800.00 | 15.38 | 7.7326 | 0.0 | 0.0 | 0.0 |
| OCT 75 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| NOV 75 | 3447.84 | 2.68 | 6.8401 | 1950.00 | 3.85 | 8.0000 | 0.0 | 0.0 | 0.0 |
| DEC 75 | 10202.16 | 7.94 | 6.7999 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| TOTALS | $ 128502.14 | | 7.5344 | $ 50700.00 | | 8.2899 | $ 0.0 | | 0.0 |
| **JUL 1975** | | | | | | | | | |
| ************************** | | | | | | | | | |
| JUL 75 | $ 51152.15 | 35.98 | 7.4181 | $ 25350.00 | 43.33 | 8.4600 | $ 0.0 | 0.0 | 0.0 |
| AUG 75 | 21647.84 | 15.23 | 7.2139 | 9750.00 | 16.67 | 7.9678 | 0.0 | 0.0 | 0.0 |
| SEP 75 | 28402.16 | 19.98 | 7.0431 | 13650.00 | 23.33 | 7.7743 | 0.0 | 0.0 | 0.0 |
| OCT 75 | 13650.00 | 9.60 | 6.9902 | 3900.00 | 6.67 | 7.6999 | 0.0 | 0.0 | 0.0 |
| NOV 75 | 3447.84 | 2.43 | 6.8401 | 1950.00 | 3.33 | 8.0000 | 0.0 | 0.0 | 0.0 |
| DEC 75 | 10202.16 | 7.18 | 6.7999 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| JAN 76 | 13650.00 | 9.60 | 6.7000 | 3900.00 | 6.67 | 7.4501 | 0.0 | 0.0 | 0.0 |
| TOTALS | $ 142152.14 | | 7.1436 | $ 58500.00 | | 8.0846 | $ 0.0 | | 0.0 |

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LIBERTY NATIONAL BANK

MATURITY DATE ANALYSIS BY TYPE OF CERTIFICATES OF DEPOSIT
(DOLLAR AMOUNTS IN THOUSANDS)

| MONTH | TYPE 0 | | | TYPE 6 | | | TYPE 8 | | |
|---|---|---|---|---|---|---|---|---|---|
| | CERT AMTS MATURING | PCT OF TOT AMT | WGHTD AVG INTST RATE | CERT AMTS MATURING | PCT OF TOT AMT | WGHTD AVG INTST RATE | CERT AMTS MATURING | PCT OF TOT AMT | WGHTD AVG INTST RATE |
| **AUG 1975** | | | | | | | | | |
| AUG 75 | $ 21647.84 | 19.22 | 7.2139 | $ 9750.00 | 20.00 | 7.9678 | $ 0.0 | 0.0 | 0.0 |
| SEP 75 | 46602.15 | 41.37 | 7.0260 | 23400.00 | 48.00 | 7.7100 | 0.0 | 0.0 | 0.0 |
| OCT 75 | 17097.84 | 15.18 | 6.9861 | 3900.00 | 8.00 | 7.6999 | 0.0 | 0.0 | 0.0 |
| NOV 75 | 3447.84 | 3.06 | 6.8401 | 1950.00 | 4.00 | 8.0000 | 0.0 | 0.0 | 0.0 |
| DEC 75 | 10202.16 | 9.06 | 6.7999 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| JAN 76 | 13650.00 | 12.12 | 6.7000 | 3900.00 | 8.00 | 7.4501 | 0.0 | 0.0 | 0.0 |
| FEB 76 | 0.0 | 0.0 | 0.0 | 5850.00 | 12.00 | 7.4099 | 0.0 | 0.0 | 0.0 |
| TOTALS | $ 112647.82 | | 6.9904 | $ 48750.00 | | 7.7155 | $ 0.0 | | 0.0 |
| **SEP 1975** | | | | | | | | | |
| SEP 75 | $ 46602.15 | 33.87 | 7.0260 | $ 23400.00 | 37.50 | 7.7100 | $ 0.0 | 0.0 | 0.0 |
| OCT 75 | 30747.84 | 22.35 | 7.0277 | 9750.00 | 15.63 | 7.6337 | 0.0 | 0.0 | 0.0 |
| NOV 75 | 13650.00 | 9.92 | 6.9970 | 7800.00 | 12.50 | 7.6698 | 0.0 | 0.0 | 0.0 |
| DEC 75 | 10202.16 | 7.41 | 6.7999 | 1950.00 | 3.13 | 7.4302 | 0.0 | 0.0 | 0.0 |
| JAN 76 | 36400.00 | 26.45 | 6.7376 | 13650.00 | 21.87 | 7.3214 | 0.0 | 0.0 | 0.0 |
| FEB 76 | 0.0 | 0.0 | 0.0 | 5850.00 | 9.38 | 7.4099 | 0.0 | 0.0 | 0.0 |
| MAR 76 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| TOTALS | $ 137602.14 | | 6.9305 | $ 62399.99 | | 7.5712 | $ 0.0 | | 0.0 |

LIBERTY NATIONAL BANK

MATURITY DATE ANALYSIS BY TYPE OF CERTIFICATES OF DEPOSIT
(DOLLAR AMOUNTS IN THOUSANDS)

| | TYPE 0 | | | TYPE 6 | | | TYPE 8 | | |
|---|---|---|---|---|---|---|---|---|---|
| | ************************************* | | | ************************************* | | | ************************************* | | |
| MONTH | CERT AMTS MATURING | PCT OF TOT AMT | WGHTD AVG INTST RATE | CERT AMTS MATURING | PCT OF TOT AMT | WGHTD AVG INTST RATE | CERT AMTS MATURING | PCT OF TOT AMT | WGHTD AVG INTST RATE |
| **OCT 1975** ************************* | | | | | | | | | |
| OCT 75 | $ 30747.84 | 25.26 | 7.0277 | $ 9750.00 | 19.23 | 7.6337 | $ 0.0 | 0.0 | 0.0 |
| NOV 75 | 27300.00 | 22.42 | 7.0737 | 13650.00 | 26.92 | 7.7001 | 0.0 | 0.0 | 0.0 |
| DEC 75 | 13650.00 | 11.21 | 6.8808 | 1950.00 | 3.85 | 7.4302 | 0.0 | 0.0 | 0.0 |
| JAN 76 | 50050.00 | 41.11 | 6.8064 | 19500.00 | 38.46 | 7.3989 | 0.0 | 0.0 | 0.0 |
| FEB 76 | 0.0 | 0.0 | 0.0 | 5850.00 | 11.54 | 7.4099 | 0.0 | 0.0 | 0.0 |
| MAR 76 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| APR 76 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| TOTALS | $ 121747.83 | | 6.9306 | $ 50700.00 | | 7.5276 | $ 0.0 | | 0.0 |
| **NOV 1975** ************************* | | | | | | | | | |
| NOV 75 | $ 27300.00 | 23.08 | 7.0737 | $ 13650.00 | 25.93 | 7.7001 | $ 0.0 | 0.0 | 0.0 |
| DEC 75 | 27300.00 | 23.08 | 7.0606 | 7800.00 | 14.81 | 7.7678 | 0.0 | 0.0 | 0.0 |
| JAN 76 | 63699.99 | 53.85 | 6.8929 | 25350.00 | 48.15 | 7.5030 | 0.0 | 0.0 | 0.0 |
| FEB 76 | 0.0 | 0.0 | 0.0 | 5850.00 | 11.11 | 7.4099 | 0.0 | 0.0 | 0.0 |
| MAR 76 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| APR 76 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| MAY 76 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| TOTALS | $ 118299.98 | | 6.9733 | $ 52650.00 | | 7.5830 | $ 0.0 | | 0.0 |

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LIBERTY NATIONAL BANK

MATURITY DATE ANALYSIS BY TYPE OF CERTIFICATES OF DEPOSIT
(DOLLAR AMOUNTS IN THOUSANDS)

| | TYPE 0 | | | TYPE 6 | | | TYPE 8 | | |
|---|---|---|---|---|---|---|---|---|---|
| MONTH | CERT AMTS MATURING | PCT OF TOT AMT | WGHTD AVG INTST RATE | CERT AMTS MATURING | PCT OF TOT AMT | WGHTD AVG INTST RATE | CERT AMTS MATURING | PCT OF TOT AMT | WGHTD AVG INTST RATE |
| **DEC 1975** | | | | | | | | | |
| DEC 75 | $ 27300.00 | 23.08 | 7.0606 | $ 7800.00 | 15.38 | 7.7678 | $ 0.0 | 0.0 | 0.0 |
| JAN 76 | 90999.99 | 76.92 | 7.0242 | 37050.00 | 73.08 | 7.6882 | 0.0 | 0.0 | 0.0 |
| FEB 76 | 0.0 | 0.0 | 0.0 | 5850.00 | 11.54 | 7.4099 | 0.0 | 0.0 | 0.0 |
| MAR 76 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| APR 76 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| MAY 76 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| JUN 76 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| TOTALS | $ 118299.99 | | 7.0326 | $ 50700.00 | | 7.6684 | $ 0.0 | | 0.0 |

LIBERTY NATIONAL BANK

PREDICTED CERTIFICATES OF DEPOSIT SALES BY MATURITY PERIOD

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30 DAY MATURITY

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(DOLLAR AMOUNTS IN THOUSANDS)

|  | TYPE 0 | | | TYPE 6 | | | TYPE 8 | | |
|---|---|---|---|---|---|---|---|---|---|
|  | BEGINNING BALANCE $ 13770.10 | | | BEGINNING BALANCE $ 2000.00 | | | BEGINNING BALANCE $ 0.0 | | |
| MONTH | CURRENT SALES | INTST RATE | NET AMOUNT OUTSTANDING | CURRENT SALES | INTST RATE | NET AMOUNT OUTSTANDING | CURRENT SALES | INTST RATE | NET AMOUNT OUTSTANDING |
| DEC 74 | $ 27300.00 | 10.320 | $ 27300.00 | $ 4675.00 | 11.000 | $ 4675.00 | $ 0.0 | 11.000 | $ 0.0 |
| JAN 75 | 23048.28 | 9.960 | 23048.28 | 17550.00 | 10.920 | 17550.00 | 0.0 | 10.920 | 0.0 |
| FEB 75 | 27300.00 | 9.170 | 27300.00 | 15600.00 | 9.960 | 15600.00 | 0.0 | 9.960 | 0.0 |
| MAR 75 | 27300.00 | 8.191 | 27300.00 | 13650.00 | 9.061 | 13650.00 | 0.0 | 9.061 | 0.0 |
| APR 75 | 27300.00 | 7.720 | 27300.00 | 11700.00 | 8.450 | 11700.00 | 0.0 | 8.450 | 0.0 |
| MAY 75 | 13650.00 | 7.290 | 13650.00 | 5850.00 | 8.049 | 5850.00 | 0.0 | 8.049 | 0.0 |
| JUN 75 | 19302.16 | 7.250 | 19302.16 | 9750.00 | 7.900 | 9750.00 | 0.0 | 7.900 | 0.0 |
| JUL 75 | 13650.00 | 7.150 | 13650.00 | 5850.00 | 7.860 | 5850.00 | 0.0 | 7.860 | 0.0 |
| AUG 75 | 18200.00 | 6.999 | 18200.00 | 9750.00 | 7.620 | 9750.00 | 0.0 | 7.620 | 0.0 |
| SEP 75 | 13650.00 | 7.080 | 13650.00 | 5850.00 | 7.590 | 5350.00 | 0.0 | 7.590 | 0.0 |
| OCT 75 | 13650.00 | 7.150 | 13650.00 | 5850.00 | 7.740 | 5850.00 | 0.0 | 7.740 | 0.0 |
| NOV 75 | 13650.00 | 7.240 | 13650.00 | 5850.00 | 7.880 | 5950.00 | 0.0 | 7.880 | 0.0 |
| DEC 75 | 27300.00 | 7.330 | 27300.00 | 11700.00 | 8.090 | 11700.00 | 0.0 | 8.090 | 0.0 |
|  | ---------- | | | ---------- | | | ---------- | | |
|  | $265300.43 | | | $123624.98 | | | $ 0.0 | | |

LIBERTY NATIONAL BANK

PREDICTED CERTIFICATES OF DEPOSIT SALES BY MATURITY PERIOD

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60 DAY MATURITY

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(DOLLAR AMOUNTS IN THOUSANDS)

| | TYPE 0 | | | TYPE 6 | | | TYPE 8 | | |
|---|---|---|---|---|---|---|---|---|---|
| | ************************************** | | | ************************************** | | | ************************************** | | |
| | BEGINNING BALANCE $ 11917.52 | | | BEGINNING BALANCE $ 12875.00 | | | BEGINNING BALANCE $ 0.0 | | |
| MONTH | CURRENT SALES | INTST RATE | NET AMOUNT OUTSTANDING | CURRENT SALES | INTST RATE | NET AMOUNT OUTSTANDING | CURRENT SALES | INTST RATE | NET AMOUNT OUTSTANDING |
| DEC 74 | $ 4491.49 | 10.290 | $ 16409.01 | $ 3900.00 | 10.970 | $ 16775.00 | $ 0.0 | 10.970 | $ 0.0 |
| JAN 75 | 16169.24 | 9.930 | 20660.73 | 0.0 | 10.890 | 3900.00 | 0.0 | 10.890 | 0.0 |
| FEB 75 | 6580.76 | 9.140 | 22750.00 | 5850.00 | 9.930 | 5850.00 | 0.0 | 9.930 | 0.0 |
| MAR 75 | 13650.00 | 8.160 | 20230.76 | 5850.00 | 9.030 | 11700.00 | 0.0 | 9.030 | 0.0 |
| APR 75 | 0.0 | 7.690 | 13650.00 | 1950.00 | 8.420 | 7800.00 | 0.0 | 8.420 | 0.0 |
| MAY 75 | 13650.00 | 7.260 | 13650.00 | 5850.00 | 8.020 | 7800.00 | 0.0 | 8.020 | 0.0 |
| JUN 75 | 3447.84 | 7.220 | 17097.84 | 0.0 | 7.870 | 5850.00 | 0.0 | 7.870 | 0.0 |
| JUL 75 | 10202.16 | 7.120 | 13650.00 | 5850.00 | 7.830 | 5850.00 | 0.0 | 7.830 | 0.0 |
| AUG 75 | 3447.84 | 6.970 | 13650.00 | 0.0 | 7.590 | 5850.00 | 0.0 | 7.590 | 0.0 |
| SEP 75 | 10202.16 | 7.050 | 13650.00 | 5850.00 | 7.560 | 5850.00 | 0.0 | 7.560 | 0.0 |
| OCT 75 | 3447.84 | 7.120 | 13650.00 | 0.0 | 7.710 | 5850.00 | 0.0 | 7.710 | 0.0 |
| NOV 75 | 13650.00 | 7.210 | 17097.84 | 5850.00 | 7.850 | 5850.00 | 0.0 | 7.850 | 0.0 |
| DEC 75 | 0.0 | 7.300 | 13650.00 | 0.0 | 8.060 | 5850.00 | 0.0 | 8.060 | 0.0 |
| | $ 98939.31 | | | $ 40950.00 | | | $ 0.0 | | |

LIBERTY NATIONAL BANK

PREDICTED CERTIFICATES OF DEPOSIT SALES BY MATURITY PERIOD

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90 DAY MATURITY

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(DOLLAR AMOUNTS IN THOUSANDS)

|  | TYPE O | | | TYPE 6 | | | TYPE 8 | | |
|---|---|---|---|---|---|---|---|---|---|
|  | ********************************** | | | ********************************** | | | ********************************** | | |
|  | BEGINNING BALANCE $ 6340.99 | | | BEGINNING BALANCE $ 0.0 | | | BEGINNING BALANCE $ 0.0 | | |
| MONTH | CURRENT SALES | INTST _RATE | NET AMOUNT OUTSTANDING | CURRENT SALES | INTST _RATE | NET AMOUNT OUTSTANDING | CURRENT SALES | INTST _RATE | NET AMOUNT OUTSTANDING |
| DEC 74 | $ 13650.00 | 10.160 | $ 19990.99 | $ 9750.00 | 10.840 | $ 9750.00 | $ 0.0 | 10.840 | $ 0.0 |
| JAN 75 | 0.0 | 9.800 | 19990.99 | 0.0 | 10.760 | 9750.00 | 0.0 | 10.760 | 0.0 |
| FEB 75 | 0.0 | 9.010 | 13650.00 | 0.0 | 9.800 | 9750.00 | 0.0 | 9.800 | 0.0 |
| MAR 75 | 13650.00 | 8.030 | 13650.00 | 3900.00 | 8.900 | 3900.00 | 0.0 | 8.900 | 0.0 |
| APR 75 | 9100.00 | 7.560 | 22750.00 | 3900.00 | 8.290 | 7800.00 | 0.0 | 8.290 | 0.0 |
| MAY 75 | 0.0 | 7.130 | 22750.00 | 0.0 | 7.890 | 7800.00 | 0.0 | 7.890 | 0.0 |
| JUN 75 | 4550.00 | 7.090 | 13650.00 | 1950.00 | 7.740 | 5850.00 | 0.0 | 7.740 | 0.0 |
| JUL 75 | 13650.00 | 6.990 | 18200.00 | 3900.00 | 7.730 | 5850.00 | 0.0 | 7.700 | 0.0 |
| AUG 75 | 0.0 | 6.840 | 18200.00 | 0.0 | 7.460 | 5850.00 | 0.0 | 7.460 | 0.0 |
| SEP 75 | 0.0 | 6.920 | 13650.00 | 1950.00 | 7.430 | 5850.00 | 0.0 | 7.430 | 0.0 |
| OCT 75 | 13650.00 | 6.990 | 13650.00 | 5850.00 | 7.580 | 7800.00 | 0.0 | 7.580 | 0.0 |
| NOV 75 | 0.0 | 7.080 | 13650.00 | 0.0 | 7.720 | 7800.00 | 0.0 | 7.720 | 0.0 |
| DEC 75 | 0.0 | 7.170 | 13650.00 | 0.0 | 7.930 | 5850.00 | 0.0 | 7.930 | 0.0 |
|  | ---------- | | | ---------- | | | ---------- | | |
|  | $ 68250.00 | | | $ 31200.00 | | | $ 0.0 | | |

LIBERTY NATIONAL BANK

PREDICTED CERTIFICATES OF DEPOSIT SALES BY MATURITY PERIOD

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120 DAY MATURITY

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(DOLLAR AMOUNTS IN THOUSANDS)

|  | TYPE 0 | | | TYPE 6 | | | TYPE 8 | | |
|---|---|---|---|---|---|---|---|---|---|
|  | ************************************* | | | ************************************* | | | ************************************* | | |
|  | BEGINNING BALANCE $ 6580.76 | | | BEGINNING BALANCE $ 0.0 | | | BEGINNING BALANCE $ 0.0 | | |
| MONTH | CURRENT SALES | INTST RATE | NET AMOUNT OUTSTANDING | CURRENT SALES | INTST RATE | NET AMOUNT OUTSTANDING | CURRENT SALES | INTST RATE | NET AMOUNT OUTSTANDING |
| DEC 74 | $ 7069.24 | 10.000 | $ 13650.00 | $ 3900.00 | 10.680 | $ 3900.00 | $ 0.0 | 10.680 | $ 0.0 |
| JAN 75 | 0.0 | 9.640 | 13650.00 | 0.0 | 10.600 | 3900.00 | 0.0 | 10.600 | 0.0 |
| FEB 75 | 0.0 | 8.850 | 13650.00 | 0.0 | 9.640 | 3900.00 | 0.0 | 9.640 | 0.0 |
| MAR 75 | 9100.00 | 7.870 | 16169.24 | 1950.00 | 8.740 | 5850.00 | 0.0 | 8.740 | 0.0 |
| APR 75 | 4550.00 | 7.400 | 13650.00 | 3900.00 | 8.130 | 5850.00 | 0.0 | 8.130 | 0.0 |
| MAY 75 | 13650.00 | 6.970 | 27300.00 | 5850.00 | 7.730 | 11700.00 | 0.0 | 7.730 | 0.0 |
| JUN 75 | 0.0 | 6.930 | 27300.00 | 0.0 | 7.580 | 11700.00 | 0.0 | 7.580 | 0.0 |
| JUL 75 | 0.0 | 6.830 | 18200.00 | 0.0 | 7.540 | 9750.00 | 0.0 | 7.540 | 0.0 |
| AUG 75 | 0.0 | 6.680 | 13650.00 | 0.0 | 7.300 | 5850.00 | 0.0 | 7.300 | 0.0 |
| SEP 75 | 22750.00 | 6.760 | 22750.00 | 9750.00 | 7.270 | 9750.00 | 0.0 | 7.270 | 0.0 |
| OCT 75 | 0.0 | 6.830 | 22750.00 | 0.0 | 7.420 | 9750.00 | 0.0 | 7.420 | 0.0 |
| NOV 75 | 0.0 | 6.920 | 22750.00 | 0.0 | 7.560 | 9750.00 | 0.0 | 7.560 | 0.0 |
| DEC 75 | 0.0 | 7.010 | 22750.00 | 0.0 | 7.770 | 9750.00 | 0.0 | 7.770 | 0.0 |
|  | ---------- | | | ---------- | | | ---------- | | |
|  | $ 57119.23 | | | $ 25350.00 | | | $ 0.0 | | |

LIBERTY NATIONAL BANK

PREDICTED CERTIFICATES OF DEPOSIT SALES BY MATURITY PERIOD

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180 DAY MATURITY

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(DOLLAR AMOUNTS IN THOUSANDS)

| | TYPE 0 | | | TYPE 6 | | | TYPE 8 | | |
|---|---|---|---|---|---|---|---|---|---|
| | **BEGINNING BALANCE $ 3447.84** | | | **BEGINNING BALANCE $ 0.0** | | | **BEGINNING BALANCE $ 0.0** | | |
| MONTH | CURRENT SALES | INTST RATE | NET AMOUNT OUTSTANDING | CURRENT SALES | INTST RATE | NET AMOUNT OUTSTANDING | CURRENT SALES | INTST RATE | NET AMOUNT OUTSTANDING |
| DEC 74 | $ 10202.16 | 9.870 | $ 13650.00 | $ 3900.00 | 10.550 | $ 3900.00 | $ 0.0 | 10.550 | $ 0.0 |
| JAN 75 | 0.0 | 9.510 | 13650.00 | 0.0 | 10.470 | 3900.00 | 0.0 | 10.470 | 0.0 |
| FEB 75 | 0.0 | 8.720 | 13650.00 | 0.0 | 9.510 | 3900.00 | 0.0 | 9.510 | 0.0 |
| MAR 75 | 0.0 | 7.740 | 13650.00 | 0.0 | 8.610 | 3900.00 | 0.0 | 8.610 | 0.0 |
| APR 75 | 0.0 | 7.270 | 13650.00 | 1950.00 | 8.000 | 5850.00 | 0.0 | 8.000 | 0.0 |
| MAY 75 | 3447.84 | 6.840 | 13650.00 | 0.0 | 7.600 | 5850.00 | 0.0 | 7.600 | 0.0 |
| JUN 75 | 10202.16 | 6.800 | 13650.00 | 3900.00 | 7.450 | 5850.00 | 0.0 | 7.450 | 0.0 |
| JUL 75 | 13650.00 | 6.700 | 27300.00 | 5850.00 | 7.410 | 11700.00 | 0.0 | 7.410 | 0.0 |
| AUG 75 | 0.0 | 6.550 | 27300.00 | 0.0 | 7.170 | 11700.00 | 0.0 | 7.170 | 0.0 |
| SEP 75 | 0.0 | 6.630 | 27300.00 | 0.0 | 7.140 | 11700.00 | 0.0 | 7.140 | 0.0 |
| OCT 75 | 0.0 | 6.700 | 27300.00 | 0.0 | 7.290 | 9750.00 | 0.0 | 7.290 | 0.0 |
| NOV 75 | 0.0 | 6.790 | 23852.16 | 0.0 | 7.430 | 9750.00 | 0.0 | 7.430 | 0.0 |
| DEC 75 | 0.0 | 6.880 | 13650.00 | 0.0 | 7.640 | 5850.00 | 0.0 | 7.640 | 0.0 |
| | $ 37502.15 | | | $ 15600.00 | | | $ 0.0 | | |

LIBERTY NATIONAL BANK

SUMMARY TOTALS BY MONTH

(DOLLAR AMOUNTS IN THOUSANDS)

| MONTH | MONTHLY SALES | MONTHLY PAYOUT | NET AMOUNT OUTSTANDING |
|---|---|---|---|
| DEC 74 | $ 88837.88 | $ 15770.10 | $129999.94 |
| JAN 75 | 88837.88 | 15770.10 | 129999.94 |
| FEB 75 | 56767.52 | 56767.52 | 129999.94 |
| MAR 75 | 55330.76 | 55330.76 | 129999.94 |
| APR 75 | 89050.00 | 89050.00 | 129999.94 |
| MAY 75 | 64350.00 | 64350.00 | 129999.94 |
| JUN 75 | 61947.84 | 61947.84 | 129999.94 |
| JUL 75 | 53102.16 | 53102.16 | 129999.94 |
| AUG 75 | 72602.13 | 72602.13 | 129999.94 |
| SEP 75 | 31397.84 | 31397.84 | 129999.94 |
| OCT 75 | 70002.13 | 70002.13 | 129999.94 |
| NOV 75 | 42447.84 | 42447.84 | 129999.94 |
| DEC 75 | 39000.00 | 39000.00 | 129999.94 |