COMPUTERIZED CREDIT ANALYSIS

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PREFACE

This paper describes the development of a commercial loan computer credit analysis model which uses various financial analysis methods. The paper describes computerized approaches to credit analysis, the general approach of the model developed in the paper, the detailed mechanisms of the model, and the potential use of the model.

I wish to express my appreciation to Dr. Winfield P. Betty for his assistance in the development of this paper and for his help in guiding the construction of this model.

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CHAPTER I

INTRODUCTION

A new breed of financial system or model is needed to facilitate ending decisions in commercial banks. (1) First generation financial ystems handle financial transactions such as accounts payable, account eceivable, payroll, and general ledger. Second generation financial ystems link together the various operating systems into a data base ut still only handle routine financial transactions. A third gener- tion of financial systems is beginning to appear which will help he manager answer "what if" questions. This type of system or model an help commercial loan officers improve the quality of their deci- ions, and implementation of such models can be facilitated by computer pplication.

The remarks which follow are intended to provide a brief over-view f the model developed in this paper. The model is of the "third eneration" type and the discussion deals with the purpose of the odel and organization of the paper. Specifically, section one deals ith purpose. This is followed by a section discussing the computer- zed conversational programming system used in the paper. Next, in an ffort to avoid difficulties in semantics, specific definitions of anagement functions are presented. The final section of Chapter I escribes the organization of the remaining chapters of the paper. Let s now turn to the reason for undertaking this study.

Purpose

The purpose of this paper is to build a credit analysis model for commercial loan officers. The model is applicable to companies during periods of growth, and uses secular trends and seasonal indicies in analyzing purpose and payment schedules. The assumption is made that an indepth analysis is necessary in loan quality control and that the cost advantages and flexibility provided by computerized procedures can provide significant benefits over manual procedures.

The model described here is implemented in the form of a time-sharing computer program. The value of a time-sharing approach is three-fold. First, banks can avoid the need for expensive computer programs since such systems usually contain a library of programs. Secondly, operational efficiencies are attained through time-sharing. Finally banks gain the ability of the computer to produce an in-depth credit analysis with a minimum of effort and time. We are now ready to identify and discuss the time-sharing software utilized in this study.

Conversational Programming Systems

Time-sharing systems allow a user to use a large scale computer with the illusion that the computer is responding to him alone. The user can communicate with the computer through typewriter-like terminals. Instead of waiting for hours for the results of an execution, the time-sharing system provides nearly instantaneous processing. (2)

The time sharing system utilized in this paper is IBM/CPS

onversational Programming System). The software is an interpretive mpiler provided by IBM. The programming language used is PL/1. The rdware is an IBM 2741 typewriter terminal which is connected to an M 65 computer.

Such a combination of hardware and software has both advantages d disadvantages. For the purposes of this paper the advantages ught are speed of response and economy of operation. The weaknesses this combination are primarily technical in nature and relate to ogramming and systems techniques. We would like to point out that e advantages far outweight the disadvantages.

To this point we have delineated the specific purpose of the udy, and we have briefly discussed the time-sharing aspect of the ogram. Where this fits in financial management is the topic of the xt section, "management functions."

Management Functions

In a going concern, management emphasis is on planning, control, d analysis. Setting objectives, policies, procedures, and standards ke up the planning function. Control is achieved by comparing tual performance to standards on a short run basis. On a longer rm basis, internal analysis is accomplished by comparing actual perience to standards. External analysis is also necessary. Before anning and decision-making can occur in any form, the decision ker must assess the external decision environment. This activity defined to be "external analysis." The model developed in this per is basically concerned with external analysis of loan requests. is is true, from the bank's point of view, since the entire

rocedure generates exogenous information which is fed into the bank's
wn decision models.

We are now ready to proceed with the content of the paper. The
udy has been introduced. To complete this chapter, the following
emarks are devoted to a discussion of over-all organization of the
aper.

Organization of the Paper

Chapter one has dealt with the purpose of this paper -- namely
o develop a model or program. This program is conversational in
ature and uses time-sharing software (IBM/CPS). Also an attempt is
ade in Chapter I to indicate where and how such a model fits into
ne basic management functions. Chapter II concerns itself with a
eview of the literature related to commercial credit analysis and
eviews the existing financial techniques and concepts which are rele-
ant to this study. Chapter III describes the design of the model to
nclude the objectives, inputs, constraints, components, and outputs
f the model. The next chapter, IV, discusses the use of the model.
inally Chapter V draws conclusions and summarizes the paper.

CHAPTER II

REVIEW OF LITERATURE AND EXISTING TECHNIQUES OF ANALYSIS

Analysis of loan requests to finance a firm's need for expanded sets in order to make increased sales is at the heart of this study. owing firms require investments in current assets and at certain ints in time in fixed assets. Investments in receivables, inventories, and fixed assets can produce a cash flow problem. Thus a stematic procedure for the identification of desired loan size and e determination of repayment schedules becomes imperative.

In this chapter, the problem is discussed from a banker's point view. A review of the literature is then followed by a discussion existing techniques of financial analysis. Let us now examine the an request from a banker's perspective.

From a banker's point of view, the systematic analysis of loan quests involves the following steps:

1) The purpose of a loan request must be identified (i.e. whether or not the request is for working capital, permanent working capital, or fixed capital).
2) Once purpose is identified, then the source of repayment of principal and interest can be defined (i.e. if purpose is for variable working capital ... cash flow, if permanent working capital .... long term income, if

fixed capital .... long term income).

3) Once steps 1) and 2) are accomplished, then several other decisions must be made:

   a) How much should be loaned (if any)?

   b) Specifically, when and in what form, should repayment be made?

In seeking answers to a) and b) above, the following steps are commended:

1) ratio analysis of trends in liquidity, leverage, activity, and profitability
2) development of cash budget
3) preparation of sources and uses of funds statements
4) projection of balance sheets and income statements.

With these data in appropriate form, a loan officer can make de-sions referred to in 3)a) and 3)b) above. The model developed in is paper is intended to provide the data in an appropriate form and it more efficiently than existing manual methods.

The viewpoint of the involved party is of keen interest in nancial analysis, but what is there in the literature that discus-s financing decisions from the banker's point of view?

Review of the Literature

The literature has a great deal to say about such activities as nancial forecasting as well as about techniques of financial analysi ile this material is relevant, little is said about a set of syste-tic activities designed to answer specific questions like 3)a) and b). For example, much of the literature deals with ratio

alysis (3). The various ratios are used to evaluate the strengths l weaknesses of a firm in a particular industry. Weston (4) clas-ies ratios into the four fundamental types (i.e liquidity, activity, rerage, and profitability). Other tools frequently mentioned are e percent of sales method and regression methods.

A review of the literature further suggests that some writers e concerned with the fundamentals of commercial credit such as pay-it size, ability to repay, quality of loans, and service of the loan partment while others are concerned with the use of computers, lels, and simulation. As in the case of ratios, however, most of ese methods are incomplete from the banker's point of view.

Johnson (5) uses the term "suitability" to refer to the compati-ity of the types of funds used in relation to the nature of the ets financed. He reiterates the general rule of financing perma-t assets with permanent funds, and sets as an objective for the ancial managers, the financing of temporary current assets with xible short term debt.

Weston and Brigham stress "financing patterns." Most industrial ms have a long term rising sales trend which accompanies seasonal les in sales. Total permanent assets rise steadily in the form current and fixed assets. Such increases in permanent assets are mally financed by long-term debt and equity. On the other hand, porary increases in assets should be covered by short-term liabili-s. If these basic rules are disregarded, a profitable firm may ome unable to meet cash obligations or suffer undesirable activity els.

According to Precourt (6) there are two prerequisites to making

a valid decision. First is an understanding of accrual accounting and the related tools of financial analysis. Second is an understanding of the ultimate need for judgment.

The risk associated with debt financing is increasing according to Vandell. (7) Corporate economic, political, and technological operating constraints have become more complex and dynamic. Debt entails a commitment to make cash payments, and adequate cash and solvency are dependent upon a relatively stable inflow stream.

The appraisal of the ability to sustain fixed cash charges is at the heart of credit analysis. The likelihood of repayment from an identifiable source within a reasonable period of time is the lending officer's main concern.

It is the responsibility of the analyst to identify the revenue-generating capacity of the borrower's assets within regional, seasonal, and industrial-economic contexts. An understanding of the underlying determinants of the borrower's cash flow behavior is essential. The reliability of cash forecasts deteriorate as they extend into the future. "Quick and dirty" models may become more useful. A cash flow projection is extremely useful at this point. Such a description of a firm's system of cash flows can show the effect on net cash flows and the cash reserve position can be measured.

The concern for loan quality at times conflicts with the necessity to beat the banking competition. Although competition requires a quick response, speed should not be gained at the expense of proper credit analysis. Sangster and Raguso (8) look to the computer to get this speed while retaining the ability to maintain appropriate safeguards for the lending institution.

Computer programs have been designed specifically for credit ılysis. Banks, of a certain size, find it feasible to replace manual ılysis procedures. The approach discussed by Sangster and Raguso :s a time-sharing program but does not have a real-time response)ability. The program produces the following reports on a six ·iod basis at a cost of approximately $25:

1) Balance sheet and income statement spread
2) Common size statements
3) Changes in working capital
4) Sources and uses of working capital
5) Ratio Analysis

These reports are based on the firm's chart of accounts and ·eral years of historical data. Their computerized procedure has ·ee steps. First historical spreads, common size statements, and ·atio analysis are produced. These relationships are incorporated financial statement projections and compared to the company's ·icipated growth. Finally the new debt and its method of consump-)n are added to the projections to produce pro-forma statements ·ealing the company's ability to repay the loan.

The lending officer is not the only interested party in credit ılysis. The management of the firm itself may be capable of ·ensive financial planning. Large and medium-scale companies ·quently have five year plans, and a few use objective analytical ·hods in compiling their forecasts.

Those firms, which use simulators such as Datran, are concerned ·h investment planning and financial analysis. Dr. Loren Benson states that financial planning must answer these questions.

1) What is the most efficient corporate resource allocation over an uncertain future?

2) What are the weaknesses and strengths of the financial aspects of the firm?

3) What are the cash requirements as a function of time?

Datran's financial model melds the elements of time with cost d revenue to determine the economic feasibility of financing plan. o-forma financial statements are produced quarterly over a ten year anning horizon. Costs and revenues derived from the market are rm numbers. Sensitivity tests show the importance of each basic sumption, develop important cost relationships, and show financial ends.

Looking back at the literature, studies and writings may be tegorized into three groups. The first group is made up of material ncerned with financial planning, control, and analysis (i.e. finanal management theory). The second group might be called quantitave in nature in that it is concerned with computers and simulation. e final category of literature is commercial bank lending material aling with the commercial loan departments and their operation. is paper is based on the financial framework expounded in the rst category using some of the computer capabilities of the second egory. The intent is to provide a complete set of information eded to make commercial loan decisions.

In an effort to tie together existing techniques and theories a form conceptually suited to the model, the remainder of this apter is devoted to diagrams and descriptions which are incorporated o the model. For example funds flow analysis (10) is a concept

d to show movements of resources in monetary terms based on iodic accounting statements. Funds flow analysis is thus a com- ative process which pinpoints shifts in financial condition and impact of operations while framing this information in a frame- k of sources and uses of funds. The concept of funds must be ad enough to include all measurable resources including cash.

Figure 1 depicts a generalized funds flow model which incorpo- es the key elements of corporate balance sheets and income state- ts. While this framework is incorporated into the model, its lementation is much more specific than the generalized framework eloped by Helfert.[1]

Another basic concept in financial management is the measurement business results through techniques of analysis. A large propor- n of these techniques involve ratios. The analysis of business rations using ratios and other measures must be undertaken with e. The realization of the importance of point of view is vital ause of differing needs for information by management, creditors lenders, and government and society. In the case of a credit lysis model, concern is primarily from the lenders point of view. io analysis is too simplistic because the lender is interested in success of the business as a total unit. Judgment about a n's total debt-worthiness, based upon many considerations, is e meaningful and is becoming increasingly accepted. This point view is reflected in the model.

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[1] Helfert, Erich A., Techniques of Financial Analysis (Homewood, 2), p. 3.

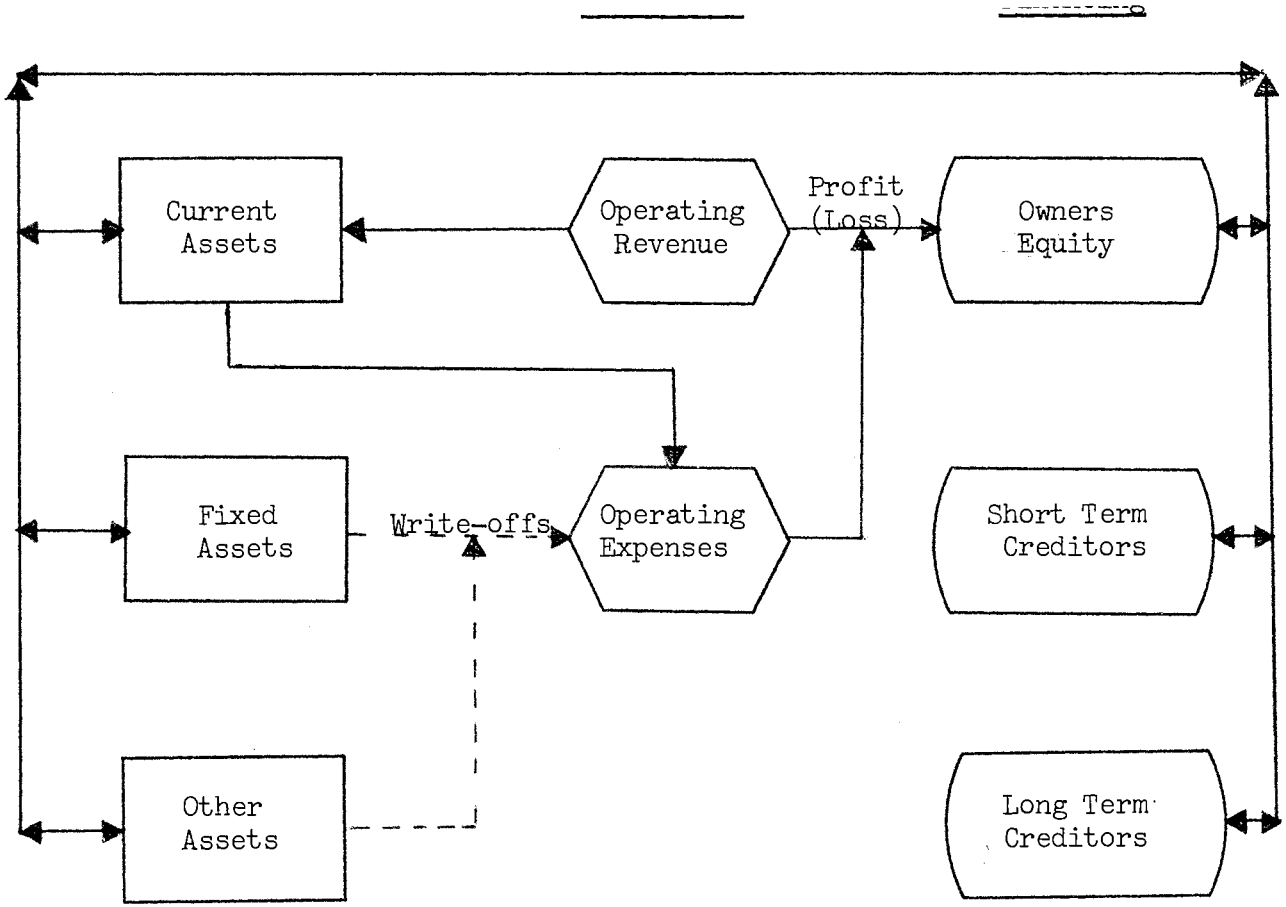

Figure 1. Generalized Flow of Funds Model

Funds flow and ratios are two tools of financial analysis work-
ıg with the past. The projection of business results involves ex-
ɪrnal analysis and projection of future conditions. The techniques
ed in these projections are operating budgets, financial budgets,
d pro-forma financial statements. Of specific interest are cash
dgets and the use of pro-forma statements. Again interrelation-
ips are important as indicated in figure 2.

In order to make decisions based on external analysis, decision
dels must be designed which use such data as inputs. Computer
pabilities have led to mathematical representation of the key
nancial relationships of a firm. Given the assumptions made by
nagement, the computer can be used to facilitate future projections
d the attendant decision. The difference between traditional
nancial projection techniques and financial modeling is in terms
speed and efficiency. One way to look at the relationships in-
lved in financial modeling can be found in figure 3.

Analysis, using modeling, supports the three following basic
ɜas of decision-making:

1) investment
2) operations
3) financing.

ɔ the purpose of this paper, it is assumed that the financing
ɔision is constrained even though we are aware of the dynamic
ɔure of the total firm. Figure 4 places the three basic areas
decision in perspective with the overall environment or model.

While the cost and value of different financing methods are
ıally the main considerations in dealing with the available

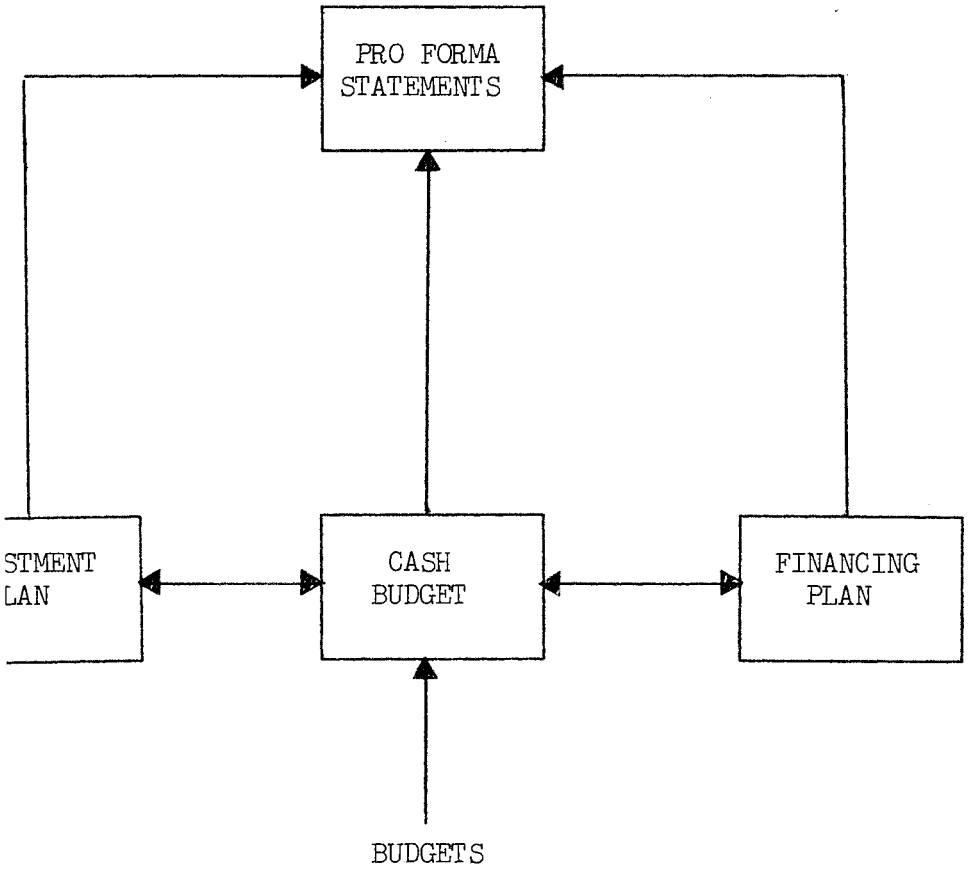

Figure 2. Cash Budgets and Pro Forma Statements

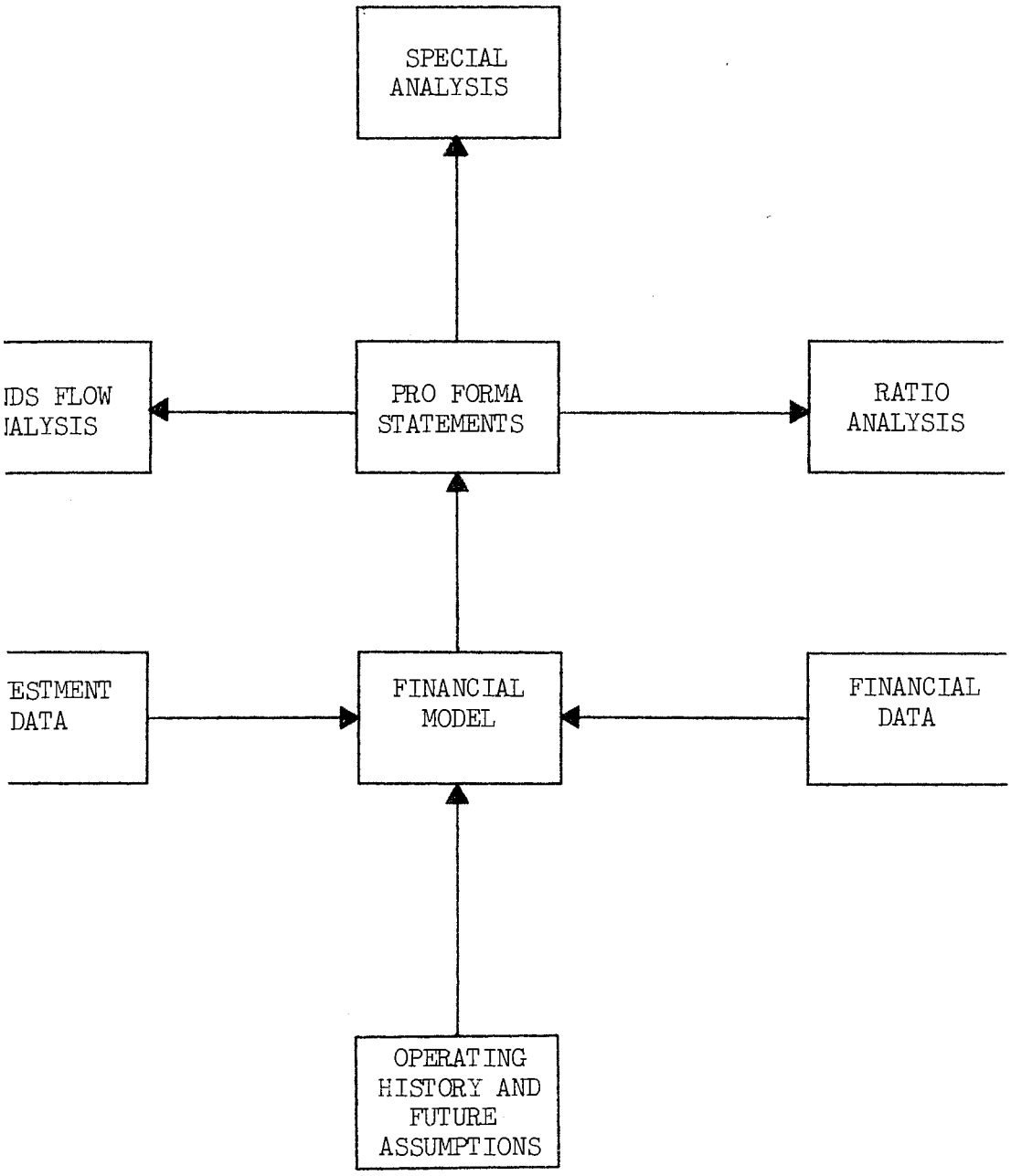

Figure 3. Relationships Involved in Financial Modeling

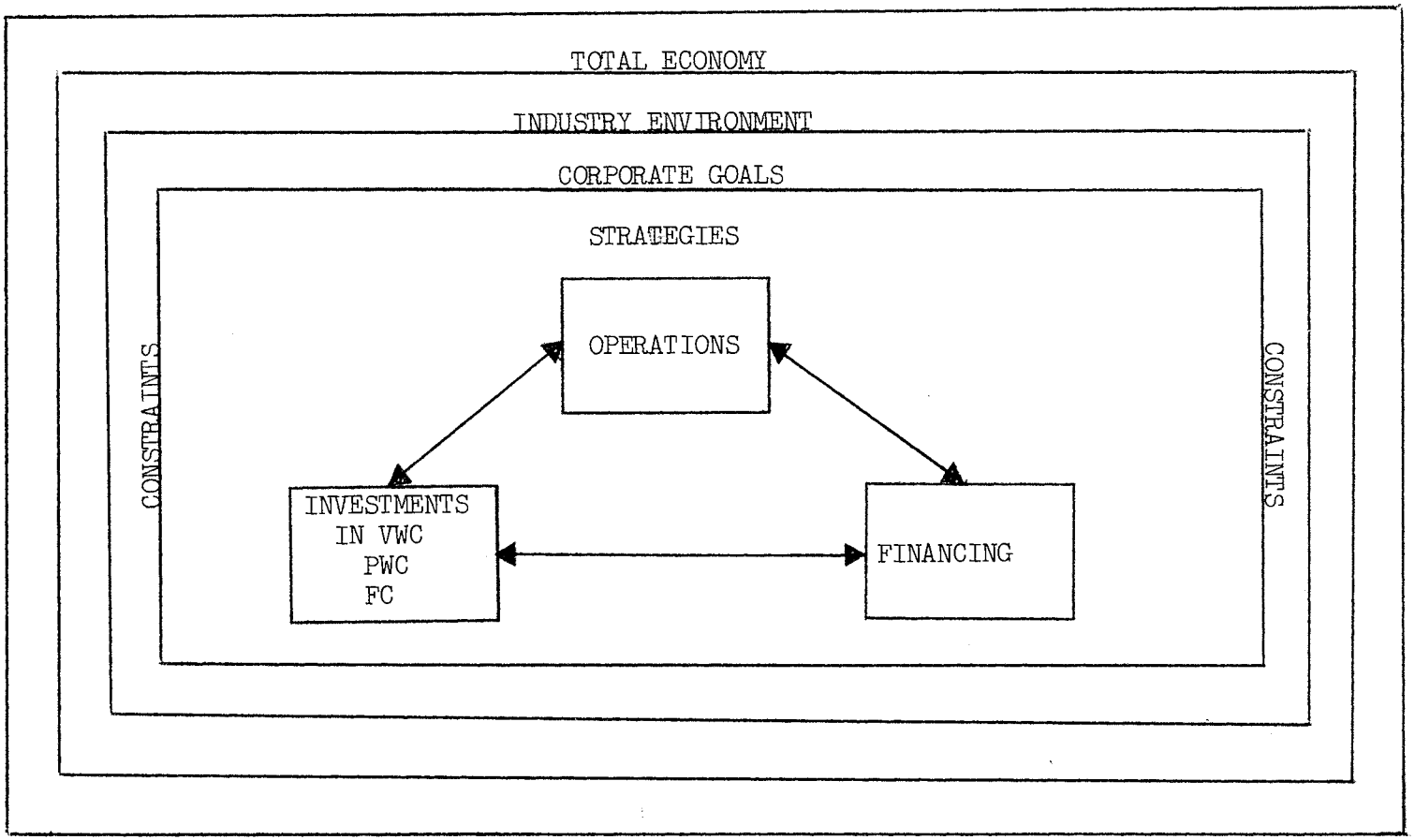

Figure 4. Comprehensive Financial Model

ancing options, for this paper it is assumed that the methods of ancing have been determined. Concern, in this paper, is with the lysis of financial funds sources for both long term and short term ds. In the case of the model developed here, the increase in per- ent current assets and the increase in fixed assets would be finan- by a commercial bank loan. Variable current assets would be anced by any of the traditional short term sources of temporary ds.

Summary

In developing the model for this study, concepts of the above hniques, procedures, and approaches have been applied. The re- ting model does synthesize a number of these techniques into a prehensive analytical procedure and model. The techniques embodied the model are ratio analysis, sources and uses of fund analysis, pro-forma financial statements. The techniques and concepts tioned above are synthesized into a long series of steps or a ocedure" to assist in the analysis of commercial credit lications.

CHAPTER III

DESIGN OF THE MODEL

The overall objective of this model is to provide certain desired
)uts. These outputs take the form of information which will verify
stated purpose of a loan and which will provide a clear picture of
payment (repayment) of the loan principal and interest from appro-
ıte sources of funds. In order to produce this information the
:l must be capable of receiving a large number of purposeful inputs.
ı of the input data is historical in nature since the past is in-
ably the key to the future. Some of the data is of a seasonal
re and some is projected or anticipated. Once the data is attained,
s manipulated and transformed to meet specific needs by the com-
r model. In order to utilize the Conversational Programming
em (CPS), the model is composed of several logic modules which
"called" if the circumstances warrant. To define the "boundaries"
he problem at hand, a number of assumptions are made so that the
l becomes physically feasible in terms of the overall program size.
e assumptions become the constraints on the system. The input data
ikewise constrained in that only the basic accounts which are
t into the program may be used. To use the model, input data must
edefined to fit the basic accounts of the model. However, certain
ralized accounts have been created to insure that all the neces-
balance sheet and income statement data can be entered.

ously, as the input accounts are constrained, so too are the output unts. The accounts are defined so as to encompass all logical ibilities so that corresponding limitations are minimal.

Input to the Model

The model requests a large number of input figures and informa-. First, up to five years of annual historical balance sheets and me statements are keyed in. Annual projected sales for up to five s are entered. Then seasonal data is entered. This seasonal data omprised of monthly balance sheet figures, monthly cash budget res, and monthly sales figures. The purpose of the loan is an t. Finally loan amounts and terms are entered. This information s a few minutes to enter. Once entered, the accounting data is in temporary disk files for use in the various logic modules.

Constraints of the Model

In order to have a model of reasonable size, the following con-ints or assumptions are employed. Basically the overriding con-int is that the loans being analyzed are to finance growth. ndary to this constraint is that the growth is for an existing uct or product line and not a new product. In other words, the od we are concerned with in terms of the product life cycle is period of growth. Uniform cycles or a distinct seasonal pattern ssumed. In identifying working capital requirements, consistent tionships between sales and working capital items are assumed. ice it to say, that the main constraints and assumptions limit comprehensiveness of the model, but at the same time these

mptions make the model workable.

Components of the Model

The control module calls the appropriate logic modules in a cal sequence. Each logic module performs a specific function. each function is completed the control model is in command. The c modules and their basic functions are shown in figure 5 below.

1

This is the program which is loaded and executed in CPS. This ram contains very little program logic. It primarily is a series calls." Each call causes a specific external procedure or logic le to be loaded and executed by CPS. At any point in time, CRANL one of the external procedures are resident in the 360/65 CPU y. CRANL takes 1 "page" and each logic module is 3 "pages" in . In CPS only 4 pages of program (s) can be in memory for a le terminal user. Thus this technique of using a control program ing a series of external procedures is a rather heavy utilization ie capabilities of CPS.

The first logic module called is CR1. This external procedure the user to key in historical financial statements and projected s figures. A number of elementary balance sheet and income state- calculations are performed. The completed historical financial ments and the skeleton pro-forma financial statements are then ned for other logic modules by writing a temporary disk file.

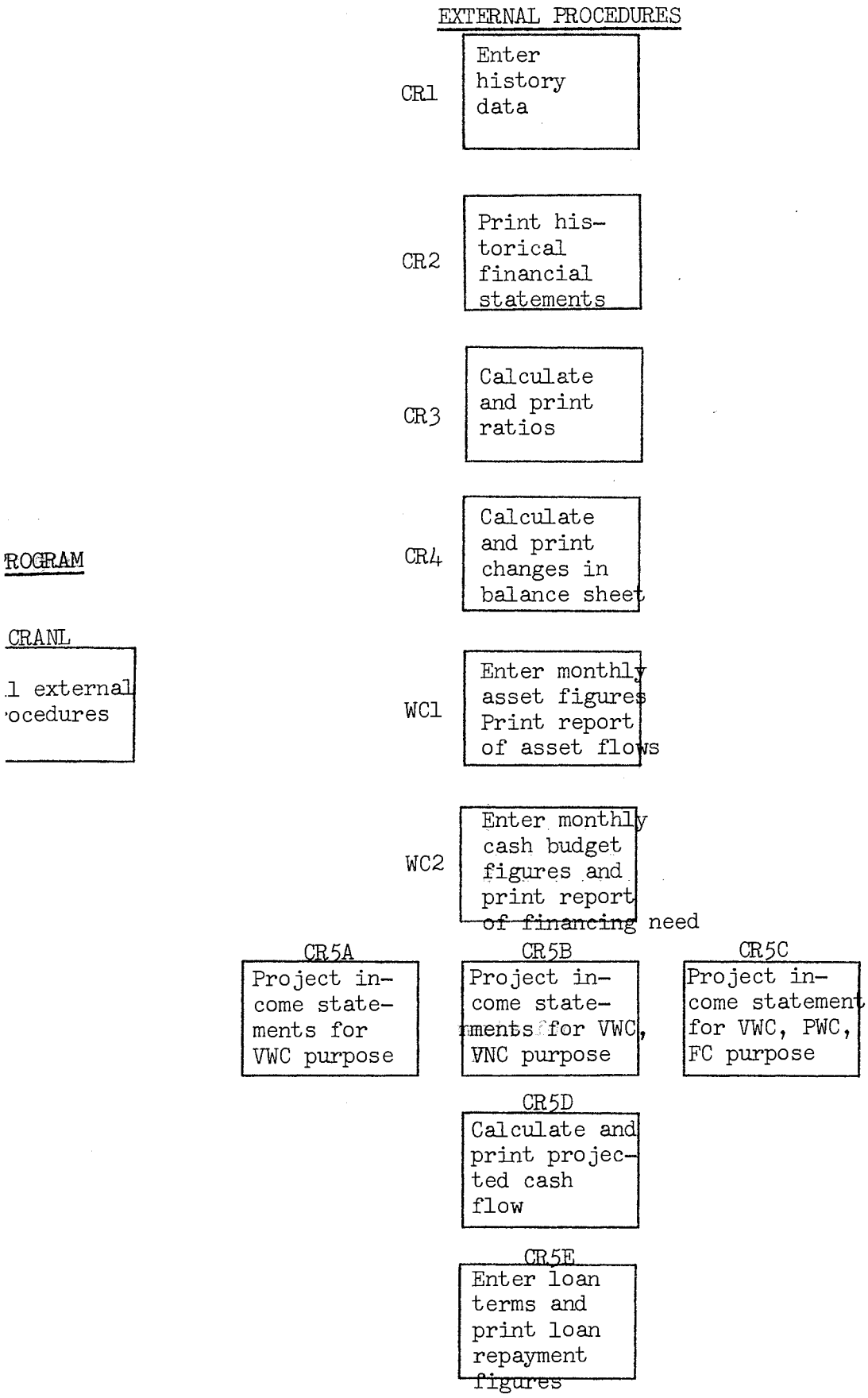

Figure 5. Logic Modules of the Model

CR2 next uses the temporary file to print balance sheets and me statements for each year of history. The intent here is to ide the user with a compact record of the history data which urnished to the model.

The temporary file is next used by CR3. This module calculates prints eleven financial ratios or figures for up to five years istorical data. These ratios are listed below:

1. Quick Ratio
2. Acid Test Ratio
3. Profit Margin
4. Net Income/Assets
5. Net Income/Equity
6. Debt/Assets
7. Long Term Debt/Capitalization
8. Debt/Equity
9. Daily Sales
10. AR/Daily Sales
11. CGS/Average Inventory

CR4 likewise accesses the temporary disk file of historical data. The n years of historical data, this external procedure calculates prints n-1 "Balance Sheet Changes" for sources and uses of funds.

ıdition to calculating the change from year to year for each
ıce sheet account and showing this change as a source or use of
ɜ, CR4 accumulates figures for total sources and total uses.

This module requires the user to provide input to the model.
time the monthly account balances for the asset accounts and
ɜales are keyed in for a twelve month period. These figures may
ıther historical or projected. The logic of WC1 works with
ı assets, permanent current assets, and variable current assets.
ɣoal here is to derive a set of relationships between the growth
ıles and changes in the three categories of assets just mentioned.
ɜ relationships shed some light on the purpose of the loan as
as on seasonal fluctuations in current assets.

More input to the model is requested by this module. Monthly
budget figures are keyed in. Beginning cash and minimum cash
ɾes are entered. The calculation that follows is a simple cash
calculation on a month by month basis. Once again the data and
ılated information is presented to the user in tabular form for
· use in the model.

, CR5B, CR5C

At this point we are ready to make projections about the future.
ɔf three modules reads the historical data and calculates pro
ɜ income statements. The historical data and the projected data

e written on a second temporary disk file for later use. CR5A is lled if the purpose of the loan is for variable current assets. 5B is called when permanent current assets or permanent working pital is the purpose of the loan. CR5C is called if the loan is finance fixed assets as well as permanent working capital.

5D

This logic module reads the temporary disk file to get the his-ical and projected data. Available cash is calculated for each ar and printed out. The net income is increased by interest and preciation. Dividends paid are deducted to give the amount of cash ch could be applied to the retirement of a loan.

E

The final external procedure asks for the purpose of the loan , when appropriate, for loan terms. The program calculates interest principal according to the purpose(s) of the financing and lists figures to be compared with the results of CR5D.

Outputs of the Model

The procedure or model intermingles outputs and inputs in a versational manner. The outputs were designed to be informative, cise, and pertinant to each phase of the analysis. The outputs be classified as historical and pro-forma.

The historical outputs are the larger group. Beginning with ancial statements, the terminal types out annual balance sheets income statements. Next the user gets up to five years of

nancial ratios from which to derive any trends. Then the program
ints a statement of balance sheet changes from one year to the next.
is is to show historical sources and uses of funds.

A transition between historical and projected data is begun when
nthly asset figures are printed out in an analysis of assets in re-
tion to growth and seasonal changes. In addition, key factors show-
g the rate of change of VCA, PCA, and FA relative to the rate of
nge of sales are listed. The transition continues with cash
lget figures.

Finally projected cash flow figures are output as the key output
the series of programs. To evaluate the repayment capability, the
st output prints the financing requirements according to the purpose
the financing and the amount.

Summary

The procedure described above executes a series of "programs"
ch run in a conversational mode. The programs request input,
rate under constraints, and print outputs to assist in the credit
ision. The next chapter describes how the commercial loan officer
ld employ the model to analyze a loan request.

CHAPTER IV

USE OF THE MODEL

As a Supplement to Judgment

The model developed in this paper is not a decision model be-
ıse it does not contain any decision-making logic in its programming.
ıt has evolved is an aid to decision-making which the commercial loar
ficer can use to analyze a firm's credit situation. By using this
:hnique the loan officer gains the speed and power of the computer
quickly perform a great many calculations. The results of these
lculations are presented in an orderly fashion or procedure which
intended to give the loan officer enough information upon which
make the decision. The procedure presented here is not intended
replace the loan officer or make any decisions but merely to assist
decisions.

As a Conversational Program

The model itself can be used with very little instruction other
ın the definition of the symbols because the programs "lead" the
:r. That is, the programs tell the user when to input data and
:n exactly what item is to be entered. Thus the person at the
'minal needs only interact with the computer in a "real-time,"
ıversational manner.

Use of IBM/CPS

In order to use the procedure developed in this paper, the user t have access to the proper combination of IBM computer hardware, tware, and typewriter terminal. At OSU these facilities are readily ilable so that all that is necessary is to know how to use these ilities.

The procedure for using IBM/CPS at OSU is as follows:

1) Turn the IBM 2741 terminal on.
2) Dial the extension telephone number of the computer (7641).
3) When the computer answers with a tone, press the "data" button on the telephone.
4) Hit the "Return" button on the terminal.
5) "Login" on the terminal.
6) Give the "Password."

The user is now ready to begin the use of the model.

Executing the Program

The control module is loaded into the "blackboard" of CPS memory ociated with the particular 2741 terminal in use by typing the mand "load (CRANL, REW)." The control module is run (executed) typing in the command "xeq." At this command, CRANL calls the st external procedure and from this point on the procedure is ected by CRANL according to the responses of the user. An example executing this program is included as the next section of this pter.

An Example

To assist the user of this program a list of symbols follows. These symbols are used both by the programs and by the user to identify accounts, sub-totals, and to provide inputs and outputs.

ccrex	- Accrued expenses account
cdepr	- Accumulated depreciation account
NS	- Conversational answer from the user
P	- Accounts payable account
R	- Accounts receivable account
Rcoll	- Accounts receivable collected
egcsh	- Beginning cash balance
A	- Current assets (total)
ash	- Cash account
asset	- Current assets (misc account)
gs	- Cost of goods sold account
liab	- Current liabilities (misc account)
ommon	- Common stock account
omdiv	- Common stock dividends paid
shdis	- Cash disbursements
shexp	- Cash expenses
shint	- Cash interest payments
shopr	- Cash operating expenses
shtax	- Cash tax payments
SHREQ	- Cash required
UMCSH	- Cumulative year to date cash required
eprex	- Depreciation expense account

- Changes in total assets

- Earnings before interest and taxes

- Earnings before taxes

- Fixed assets (total)

- Ratio of asset inflow to sales

- Ratio of change in current assets to change in sales

- Ratio of change in fixed assets to change in sales

- Gross Margin

- Accounting period

- Interest paid account

- Inventory account

t - Long term debt account

c - Marketable securities account

n - Minimum cash

H - Net cash (total receipts less total disbursements)

- Net income

- Notes payable account

x - Operating expense account

R - Operating profit

a - Other assets account

c - Other income account

- Preferred stock account

v - Preferred dividend paid

- Property account

- Retained earnings account

- Sales account

S - Proceeds from sale of marketable securities

es - Taxes account

- Total assets (total capital)

ASS - Total assets (subtotal)

CA - Total current assets (subtotal)

CL - Total current liabilities (subtotal)

DIS - Total cash disbursements

LNW - Total liabilities and net worth

his - number of years of historical financial statements

pro - number of years of pro forma financial statements

ple Execution

The firm requesting financing in this example is a small manu-turer of women's and girl's skirts and dresses. The loan request for approximately $170,000 most of which is thought to be for ancing of current assets.

After performing "login" to CPS and after loading the program, ready to proceed with the example. By typing in 'xeq' the program ins to execute.

The first instructions given by the model tell us to enter the ber of years of annual financial statements we wish to use for tory. When we enter the number of years, the program requests ance sheet data, income statement data, and dividends paid for ı year of the history. Next the program asks for the minimum ı balance desired.

```
in(busl, 12243)
3WORD:
) AFTERNOON:  USER 02; TIME  12:30:03  4/11/74;
ı(CRANL, REW)
```

JRE TO PERFORM A STEPWISE COMMERCIAL CREDIT ANALYSIS

;he number of years of historical statements to be keyed in

ıistorical data for year 1

)alance sheet data

)

ıncome statement data

L)
)

ɪividends paid
(1)

(1)

ıinimum cash
(1)

he number of years of pro-forma financial statements, to be

ɪ, is asked for by the program. When received, the program

sks for projected sales for each of these years.

the number of years of pro-forma statements to be created

```
ter the projected sales for  5  years
les(3)
0000
les(4)
0000
```

The program now begins to print out a financial analysis of the storical data. First, balance sheets and income statements are inted out for each year of historical data up to five years. This done primarily to verify the correct entry of the data.

```
LANCE SHEET YR 2 INCOME STATEMENT

sh    $   5000   Sales    $ 600000
tsec      15000   Cgs         300000
          20000   GM          300000
v         30000   Operex       50000
sset          0   Deprex       12000
TCA       70000   OPERPR      238000
op       180000   Othinc           0
depr      50000   EBIT        238000
hera          0   Int          10000
TASS     200000   EBT         228000
                  Taxes       200000
           6000   Nl           28000
tes       10000
crex          0
iab       14000
TCL       30000
debt      70000
mmon      50000
d         10000
          40000
TLNW     200000
```

A ratio analysis follows which prints eleven ratios for each ar of historical data. Here trends can be determined in any of e four areas of liquidity, activity, leverage, and profitability comparing with industry ratios.

YR=	1	2	3	4	5	
RATIO	2.14:1	2.33:1	0. :1	0. :1	0. :1	
'EST RATIO	1.43:1	1.33:1	0. :1	0. :1	0. :1	
' MARGIN	.16	.05	0.	0.	0.	
;ETS	.43	.14	0.	0.	0.	
JITY	.38	.28	0.	0.	0.	
\SSETS	.51	.50	0.	0.	0.	
3T/CAPL	.40	.41	0.	0.	0.	
EQUITY	1.36	1.25	0.	0.	0.	
SALES	$ 1370	$ 1644	$ 0	$ 0	$ 0	
[SALES	11	12	0	0	0	TIMES
/E INV	0	11	0	0	0	TIMES

Next a report of balance sheet changes is given for each period
en the historical balance sheets. This analysis shows the
e of funds and the use. Here a judgment can be made as to the
priateness of the use of funds based upon the source.

CE SHEET CHANGES
1 to 2

NT	SOURCE	USE
	5000	
c	10000	
		5000
		5000
:t		
		30000
)r	10000	
'a		
		4000
;		5000
:x		
)	4000	
)t	10000	
)n		
	10000	
L	49000	49000

The program instructs us to enter monthly balance sheet informa-
on assets covering a period of 12 months. This is done to get
cture of total assets, fixed assets, and current assets as they
tuate with seasonal changes in sales. The program prints this

)rmation out in a table. Three figures are printed out for use in
ure calculations. These figures are ratios which link fluctuation
rariable current assets to sales, increases in permanent current
:ts to sales, and changes in fixed assets to sales.

:r monthly balance sheet information on assets

)(1)
)0
.)
)0
.1)
)0
:et(1)

)(1)
)00
:ra(1)

:h	TOTAL ASSETS	CURRENT ASSETS	FIXED ASSETS	SALES
-	200000	50000	150000	30000
2	209000	54000	155000	35000
3	217000	60000	157000	40000
4	214000	57000	157000	45000
5	211000	54000	157000	49000
6	215000	57000	158000	35000
7	229000	60000	160000	42000
8	228000	63000	165000	48000
9	235000	65000	170000	53000
0	239000	66000	173000	51000
-	244000	67000	177000	40000
2	250000	70000	180000	50000

.3
1
1.5

Now the program tells us to enter projected monthly cash budget
ures. Once completed, the program asks for a beginning cash

ance and a minimum cash figure for our monthly data. After enter-
these figures, the typewriter types out a message asking if we
h to see the monthly cash budget figures. We do, so we type in
s.' The program responds with a table for 12 months showing total
eipts, total disbursements, net cash, year-to-date cumulative cash,
imum cash, and year-to-date cash required. The year-to-date cash
uired at year end tells us how much permenant financing we need.
minimum amount in the year-to-date cash required column shows us
large the line of credit needs to be for this firm. The last two
ures printed out by the program show us the total of the months
h an inflow of cash and the net of all inflows and outflows.
er monthly cash budget figures

oll(1)
OO

you wish to see the monthly cash budget figures?

TH	TOTREC	TOTDIS	NETCSH	CUMSCH	Mincsh	CSHREQ
L	36000	108000	-72000	-62000	15000	-77000
2	36000	48600	-12600	-74600	15000	-89600
3	35000	48600	-12600	-87200	15000	-102200
4	42000	6600	35400	-51800	15900	-66800
5	63000	95400	-32400	-84200	15000	-99200
6	93000	125100	-32100	-116300	15000	-131300
7	147000	91300	55700	-60600	15000	-75600
8	193000	7300	100700	40100	15000	25100
9	54000	125800	-71800	-31700	15000	-46700
0	36000	56600	-20600	-52300	15000	-67300
L	36000	56600	-20600	-72900	15000	-87900
2	35000	48600	-12600	-85500	15000	-100500
OW=	178800					
LO-INFLO=		100500				

The procedure is now ready to project pro-forma data. The ;ram asks for the purpose of the loan. It uses this purpose to . the external procedure which projects the accounts according he purpose. Each of these three logic modules asks for "F1," ." and "F3" from a prior step. The program continues at this it by printing a cash flow for each year that is projected. Net me after taxes plus interest payments and depreciation give the nt of cash before dividend payments. With dividend payments racted out, the final cash figure for each year gives the total ability of the firm to pay interest and principal. The loan cer now has an estimate of the firm's repayment capacity.

er purpose of loan as shown below
) finance variable current assets
) finance permanent current assets
) finance fixed assets

os

3 CASH FLOW

$156314
10000
12999

179313

12000
10000

157313

Once again the program asks the user to enter the purpose of th financing. This time the program uses the response to ask for the amount of each type of financing. The program replies with a statement about the seasonal (i.e. variable working capital) financing. If permanent working capital is requested, the program asks for the annual interest rate and assumes repayment in one year. Finally if fixed capital is being financed, the program asks for the interest rate. With this information the program prints out the level payment amount for repayment terms of 1 to 10 years.

```
Enter the purpose of the financing

1=financing VWC
2=financing VWC & PWC
3=financing VWC, PWC, & FC
purpos
3

Enter the amount of financing(loan) for each purpose

VWCLN
31000
PWCLN
100000
FCLN
15000

Financing for seasonal fluctuations =  31000

Financing PWC

Enter the interest rate
rnint
.10

Principal =  100000
Interest =  10000

Financing fixed capital

Enter the interest rate
rnint
.10
```

```
= 1  LEVEL  PYMT =  16500
= 2  LEVEL  PYMT =  8642.8671428572
= 3  LEVEL  PYMT =  6031.7220543807
= 4  LEVEL  PYMT =  4732.0620555015
= 5  LEVEL  PYMT =  3958.9522119212
= 6  LEVEL  PYMT =  3444.11079544
= 7  LEVEL  PYMT =  3081.9224855980
= 8  LEVEL  PYMT =  2811.6602836222
= 9  LEVEL  PYMT =  2604.6080861152
=10  LEVEL  PYMT =  2441.1009232377
```

The program has now completed execution. The loan officer has analysis of historical financial statements to examine for trends for proper financing patterns. He also has seasonal information ch has been used to project pro-forma financial information. The h budget information can give him an idea of the type and amount financing needed for current assets. The final two outputs give repayment capability and the amount of repayment needed for the uested financing. With this series of inputs and outputs the loan icer has an organized set of aids to his decision-making process.

From the example presented here, the loan officer can infer that firm needs a line of credit of $131,000 of which $100,000 is ded to finance permanent working capital. Since the request is $100,000 to finance permanent working capital and $15,000 for ed capital, the purpose of the loan is roughly correct. The re- ment is $126,500 in one year while the cash flow for that year is 7,313. So the firm has the capability to repay the amount in stion. In answering the basic questions about the size of the n and repayment schedule, the loan officer has at his fingertips ios, a sources and uses of funds statement, asset fluctuation a, and cash budget information. There are many more qualitative behavioral factors involved in such a decision, to be sure, but

s program can help with many of the analytical aspects of decision-ing. For this reason, it seems the model has definite potential the world of commercial bank lending.

Potential Use of the Model

This model could be used by a bank in its commercial loan de-tment to evaluate the loan requests to finance growth. Similar els, or more comprehensive models, could help evaluate applications firms seeking funds for purposes other than growth.

The time-sharing aspect of this model makes it economically sible for banks to use. The quick response and the large number calculations performed make such a tool valuable to a bank in roving the quality of its loans. Those same benefits can be seen enhance the competitive position of the bank.

Summary

This model is an aid to the loan officer which utilizes the er and speed of the computer in a conversational manner. The gram is written in CPS/PL1 for use on an IBM 360 computer which the IBM/CPS program product as a software feature. The user t be familiar with the procedures of the installation (OSU) to cute the program. Once loaded and executed the program will give terminal user sufficient instructions to successfully run the gram to completion. Finally, this model, while designed specifi-ly for CPS, could be modified for "batch" processing or made nable to other time sharing systems with a minimum effort.

CHAPTER V

CONCLUSION AND SUMMARY

This project was undertaken to create a model to perform a ommercial credit analysis. During the development of the model, onstraints were added, to make the project feasible. For example, he resulting program provides a credit analysis for firms whose roduct is in the growth or mature stage of the product life cycle.

A more comprehensive model that included demand analysis and hich would also be stochastic would require a great programming ffort and would require a different approach from the one used ere to exploit conversational programming.

The results of this project show that such models can be con- tructed. Final evaluation of the model developed in this paper will epend on actual usage in a number of trial analyses. Only by test- ng the model on a volume basis can its effectiveness be determined.

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APPENDIX A

LISTING OF COMPUTER PROGRAMS

```
CRANL
          /*This program calls the logic modules which */;
          /*perform the commercial credit analsis*/;
          /*For specific functions performed see */;
          /*the module which performs those functions*/;
          DECLARE  CR1 ENTRY  EXT;
          DECLARE  CR2 ENTRY  EXT;
          DECLARE  CR3 ENTRY  EXT;
          DECLARE  CR4 ENTRY  EXT;
          DECLARE  CR5A ENTRY  EXT;
          DECLARE  CR5B ENTRY  EXT;
          DECLARE  CR5C ENTRY  EXT;
          DECLARE  CR5D ENTRY  EXT;
          DECLARE  CR5E ENTRY  EXT;
          DECLARE  WC1 ENTRY  EXT;
          DECLARE  WC2 ENTRY  EXT;
          CALL CR1;
          ;
          CALL CR2;
          RELEASE ;
          CALL CR3;
          RELEASE ;
          CALL CR4;
          RELEASE ;
          CALL WC1;
          RELEASE ;
          CALL WC2;
          RELEASE ;
          PUT LIST('');
          PUT LIST('Enter purpose of loan as shown below');
          PUT LIST('1=to finance variable current assets');
          PUT LIST('2=to finance permanent current assets');
          PUT LIST('3=to finance fixed assets');
          PUT LIST('');
          GET LIST(purpos);
          IF purpos=1 THEN CALL CR5A;
          IF purpos=2 THEN CALL CR5B;
          IF purpos=3 THEN CALL CR5C;
          CALL CR5D;
          RELEASE ;
          CALL CR5E;
          RELEASE ;
```

```
R1)

CR1:    PROCEDURE ;
        DECLARE  @Cranl FILE OUTPUT ENV( V(60)  ) ;
        DECLARE Cash(10) DEC(6);
        DECLARE Mktsec(10) DEC(6);
        DECLARE AR(10) DEC(6);
        DECLARE Inv(10) DEC(6);
        DECLARE Casset(10) DEC(6);
        DECLARE TOTCA(10) DEC(6);
        DECLARE Prop(10) DEC(6);
        DECLARE Acdepr(10) DEC(6);
        DECLARE Othera(10) DEC(6);
        DECLARE TOTASS(10) DEC(6);
        DECLARE AP(10) DEC(6);
        DECLARE Notes(10) DEC(6);
        DECLARE Accrex(10) DEC(6);
        DECLARE Cliab(10) DEC(6);
        DECLARE TOTCL(10) DEC(6);
        DECLARE Ltdebt(10) DEC(6);
        DECLARE Common(10) DEC(6);
        DECLARE Pfd(10) DEC(6);
        DECLARE RE(10) DEC(6);
        DECLARE TOTLNW(10) DEC(6);
        DECLARE Sales(10) DEC(6);
        DECLARE Cgs(10) DEC(6);
        DECLARE GM(10) DEC(6);
        DECLARE Operex(10) DEC(6);
        DECLARE Deprex(10) DEC(6);
        DECLARE OPERPR(10) DEC(6);
        DECLARE Othinc(10) DEC(6);
        DECLARE EBIT(10) DEC(6);
        DECLARE Int(10) DEC(6);
        DECLARE EBT(10) DEC(6);
        DECLARE Taxes(10) DEC(6);
        DECLARE NI(10) DEC(6);
        DECLARE Comdiv(10) DEC(6);
        DECLARE Pfddiv(10) DEC(6);
        DECLARE Fncash(1) DEC(6);
A01:    PUT LIST('');
        PUT LIST('PROCEDURE TO PERFORM A STEPWISE COMMERCIAL CREDIT ANALYSIS')
A02:    PUT LIST('');
        PUT LIST('Enter the number of years of historical statements to be key
        GET LIST(yrshis);
        PUT LIST('');
        IF yrshis<1 THEN GO TO A02;
        IF yrshis>5 THEN GO TO A02;
A06:    DO i=1 TO yrshis;
        PUT LIST('Enter historical data for year ',i);
        PUT LIST('');
        PUT LIST('Enter balance sheet data');
        PUT LIST('');
        GET LIST(Cash(i),Mktsec(i),AR(i),Inv(i),Casset(i));
        GET LIST(Prop(i),Acdepr(i),Othera(i));
        GET LIST(AP(i),Notes(i),Accrex(i),Cliab(i));
        GET LIST(Ltdebt(i),Common(i),Pfd(i),RE(i));
        PUT LIST('');
        PUT LIST('Enter income statement data');
        PUT LIST('');
        GET LIST(Sales(i),Cgs(i),Operex(i),Deprex(i));
        GET LIST(Othinc(i),Int(i),Taxes(i));
        PUT LIST('');
        PUT LIST('Enter dividends paid');
        GET LIST(Comdiv(i),Pfddiv(i));
        PUT LIST('');
```

```
END ;
PUT LIST('Enter minimum cash');
GET LIST(Mncash);
PUT LIST('');
DO i=1 TO yrshis;
TOTCA(i)=Cash(i)+Mktsec(i)+Inv(i)+AR(i)+Casset(i);
TOTASS(i)=TOTCA(i)+Prop(i)+Othera(i)-Acdepr(i);
TOTCL(i)=AP(i)+Notes(i)+Accrex(i)+Cliab(i);
TOTLNW(i)=TOTCL(i)+Ltdebt(i)+Common(i)+Pfd(i)+R_E(i);
GM(i)=Sales(i)-Cgs(i);
OPERPR(i)=GM(i)-Operex(i)-Deprex(i);
EBIT(i)=OPERPR(i)+Othinc(i);
EBT(i)=EBIT(i)-Int(i);
NI(i)=EBT(i)-Taxes(i);
END ;
;
PUT LIST('Enter th number of years of pro forma statements to be creat
GET LIST(yrspro);
PUT LIST('');
PUT LIST('Enter the projected sales for ',yrspro,' years');
DO i=yrshis+1 TO yrshis+yrspro;
GET LIST(Sales(i));
END ;
DO i=yrshis+1 TO 10;
Cash(i)=Mncash(1);
Mktsec(i)=Mktsec(yrshis);
Casset(i)=Casset(yrshis);
Prop(i)=Prop(yrshis);
Othera(i)=Othera(yrshis);
Common(i)=Common(yrshis);
Pfd(i)=Pfd(yrshis);
Comdiv(i)=Comdiv(yrshis);
Pfddiv(i)=Pfddiv(yrshis);
END ;
OPEN FILE(@Cranl) OUTPUT ;
WRITE FILE(@Cranl) FROM(yrshis) ;
WRITE FILE(@Cranl) FROM(Cash) ;
WRITE FILE(@Cranl) FROM(Mktsec) ;
WRITE FILE(@Cranl) FROM(AR) ;
WRITE FILE(@Cranl) FROM(Inv) ;
WRITE FILE(@Cranl) FROM(Casset) ;
WRITE FILE(@Cranl) FROM(TOTCA) ;
WRITE FILE(@Cranl) FROM(Prop) ;
WRITE FILE(@Cranl) FROM(Acdepr) ;
WRITE FILE(@Cranl) FROM(Othera) ;
WRITE FILE(@Cranl) FROM(TOTASS) ;
WRITE FILE(@Cranl) FROM(AP) ;
WRITE FILE(@Cranl) FROM(Notes) ;
WRITE FILE(@Cranl) FROM(Accrex) ;
WRITE FILE(@Cranl) FROM(Cliab) ;
WRITE FILE(@Cranl) FROM(TOTCL) ;
WRITE FILE(@Cranl) FROM(Ltdebt) ;
WRITE FILE(@Cranl) FROM(Common) ;
WRITE FILE(@Cranl) FROM(Pfd) ;
WRITE FILE(@Cranl) FROM(RE) ;
WRITE FILE(@Cranl) FROM(TOTLNW) ;
WRITE FILE(@Cranl) FROM(Sales) ;
WRITE FILE(@Cranl) FROM(Cgs) ;
WRITE FILE(@Cranl) FROM(GM) ;
WRITE FILE(@Cranl) FROM(Operex) ;
WRITE FILE(@Cranl) FROM(Deprex) ;
WRITE FILE(@Cranl) FROM(OPERPR) ;
WRITE FILE(@Cranl) FROM(Othinc) ;
WRITE FILE(@Cranl) FROM(EBIT) ;
WRITE FILE(@Cranl) FROM(Int) ;
```

```
WRITE FILE(@Cranl) FROM(EBT) ;
WRITE FILE(@Cranl) FROM(Taxes) ;
WRITE FILE(@Cranl) FROM(NI) ;
WRITE FILE(@Cranl) FROM(Comdiv) ;
WRITE FILE(@Cranl) FROM(Pfddiv) ;
WRITE FILE(@Cranl) FROM(yrspro) ;
END CR1;
```

R2)

```
CR2:    PROCEDURE ;
        DECLARE  @Cranl FILE INPUT ;
        DECLARE Cash(10) DEC(6);
        DECLARE Mktsec(10) DEC(6);
        DECLARE AR(10) DEC(6);
        DECLARE Inv(10) DEC(6);
        ;
        DECLARE Casset(10) DEC(6);
        DECLARE TOTCA(10) DEC(6);
        DECLARE Prop(10) DEC(6);
        ;
        DECLARE Acdepr(10) DEC(6);
        DECLARE Othera(10) DEC(6);
        DECLARE TOTASS(10) DEC(6);
        DECLARE AP(10) DEC(6);
        DECLARE Notes(10) DEC(6);
        DECLARE Accrex(10) DEC(6);
        ;
        ;
        DECLARE Cliab(10) DEC(6);
        DECLARE TOTCL(10) DEC(6);
        DECLARE Ltdebt(10) DEC(6);
        DECLARE Common(10) DEC(6);
        DECLARE Pfd(10) DEC(6);
        DECLARE RE(10) DEC(6);
        DECLARE TOTLNW(10) DEC(6);
        DECLARE Sales(10) DEC(6);
        DECLARE Cgs(10) DEC(6);
        DECLARE GM(10) DEC(6);
        DECLARE Operex(10) DEC(6);
        DECLARE Deprex(10) DEC(6);
        DECLARE OPERPR(10) DEC(6);
        DECLARE Othinc(10) DEC(6);
        DECLARE EBIT(10) DEC(6);
        DECLARE Int(10) DEC(6);
        DECLARE EBT(10) DEC(6);
        DECLARE Taxes(10) DEC(6);
        DECLARE NI(10) DEC(6);
        DECLARE Comdiv(10) DEC(6);
        DECLARE Pfddiv(10) DEC(6);
        DECLARE Mncash(1) DEC(6);
image1: IMAGE;
 $-------  ------- $-------
image2: IMAGE;
 -------   -------  -------
image3: IMAGE;
          -------  -------
image4: IMAGE;
 -------
        OPEN FILE(@Cranl) INPUT ;
        READ FILE(@Cranl) INTO(yrshis) ;
        READ FILE(@Cranl) INTO(Cash) ;
        READ FILE(@Cranl) INTO(Mktsec) ;
        READ FILE(@Cranl) INTO(AR) ;
        READ FILE(@Cranl) INTO(Inv) ;
        READ FILE(@Cranl) INTO(Casset) ;
        READ FILE(@Cranl) INTO(TOTCA) ;
        READ FILE(@Cranl) INTO(Prop) ;
        READ FILE(@Cranl) INTO(Acdepr) ;
        READ FILE(@Cranl) INTO(Othera) ;
        READ FILE(@Cranl) INTO(TOTASS) ;
        READ FILE(@Cranl) INTO(AP) ;
        READ FILE(@Cranl) INTO(Notes) ;
        READ FILE(@Cranl) INTO(Accrex) ;
```

```
        READ FILE(@Cranl) INTO(Cliab) ;
        READ FILE(@Cranl) INTO(TOTCL) ;
        READ FILE(@Cranl) INTO(Ltdebt) ;
        READ FILE(@Cranl) INTO(Common) ;
        READ FILE(@Cranl) INTO(Pfd) ;
        READ FILE(@Cranl) INTO(RE) ;
        READ FILE(@Cranl) INTO(TOTLNW) ;
        READ FILE(@Cranl) INTO(Sales) ;
        READ FILE(@Cranl) INTO(Cgs) ;
        READ FILE(@Cranl) INTO(GM) ;
        READ FILE(@Cranl) INTO(Operex) ;
        READ FILE(@Cranl) INTO(Deprex) ;
        READ FILE(@Cranl) INTO(OPERPR) ;
        READ FILE(@Cranl) INTO(Othinc) ;
        READ FILE(@Cranl) INTO(EBIT) ;
        READ FILE(@Cranl) INTO(Int) ;
        READ FILE(@Cranl) INTO(EBT) ;
        READ FILE(@Cranl) INTO(Taxes) ;
        READ FILE(@Cranl) INTO(NI) ;
        READ FILE(@Cranl) INTO(Comdiv) ;
        READ FILE(@Cranl) INTO(Pfddiv) ;
A09:    DO i=1 TO yrshis;
        PUT LIST('');
        PUT LIST('BALANCE SHEET YR',i,'INCOME STATEMENT');
        PUT LIST('');
        PUT IMAGE('Cash',Cash(i),'Sales',Sales(i))(image1);
        PUT IMAGE('Mktsec',Mktsec(i),'Cgs',Cgs(i))(image2);
        PUT IMAGE('AR',AR(i),'GM',GM(i))(image2);
        PUT IMAGE('Inv',Inv(i),'Operex',Operex(i))(image2);
        PUT IMAGE('Casset',Casset(i),'Deprex',Deprex(i))(image2);
        PUT IMAGE('TOTCA',TOTCA(i),'OPERPR',OPERPR(i))(image2);
        PUT IMAGE('Prop',Prop(i),'Othinc',Othinc(i))(image2);
        PUT IMAGE('Acdepr',Acdepr(i),'EBIT',EBIT(i))(image2);
        PUT IMAGE('Othera',Othera(i),'Int',Int(i))(image2);
        PUT IMAGE('TOTASS',TOTASS(i),'EBT',EBT(i))(image2);
        PUT IMAGE('Taxes',Taxes(i))(image3);
        PUT IMAGE('AP',AP(i),'NI',NI(i))(image2);
        PUT IMAGE('Notes',Notes(i))(image4);
        PUT IMAGE('Accrex',Accrex(i))(image4);
        PUT IMAGE('Cliab',Cliab(i))(image4);
        PUT IMAGE('TOTCL',TOTCL(i))(image4);
        PUT IMAGE('Ltdebt',Ltdebt(i))(image4);
        PUT IMAGE('Common',Common(i))(image4);
        PUT IMAGE('Pfd',Pfd(i))(image4);
        PUT IMAGE('RE',RE(i))(image4);
        PUT IMAGE('TOTLNW',TOTLNW(i))(image4);
        PUT LIST('');
        END ;
        CLOSE FILE(@Cranl) ;
        END CR2;
```

```
;
3)

    CR3:    PROCEDURE ;
            DECLARE  @Cranl FILE INPUT ;
            DECLARE Cash(10) DEC(6);
            DECLARE Mktsec(10) DEC(6);
            DECLARE AR(10) DEC(6);
            DECLARE Inv(10) DEC(6);
            ;
            DECLARE Casset(10) DEC(6);
            DECLARE TOTCA(10) DEC(6);
            DECLARE Prop(10) DEC(6);
            ;
            DECLARE Acdepr(10) DEC(6);
            DECLARE Othera(10) DEC(6);
            DECLARE TOTASS(10) DEC(6);
            DECLARE AP(10) DEC(6);
            DECLARE Notes(10) DEC(6);
            DECLARE Accrex(10) DEC(6);
            ;
            ;
            DECLARE Cliab(10) DEC(6);
            DECLARE TOTCL(10) DEC(6);
            DECLARE Ltdebt(10) DEC(6);
            DECLARE Common(10) DEC(6);
            DECLARE Pfd(10) DEC(6);
            DECLARE RE(10) DEC(6);
            DECLARE TOTLNW(10) DEC(6);
            DECLARE Sales(10) DEC(6);
            DECLARE Cgs(10) DEC(6);
            DECLARE GM(10) DEC(6);
            DECLARE Operex(10) DEC(6);
            DECLARE Deprex(10) DEC(6);
            DECLARE OPERPR(10) DEC(6);
            DECLARE Othinc(10) DEC(6);
            DECLARE EBIT(10) DEC(6);
            DECLARE Int(10) DEC(6);
            DECLARE EBT(10) DEC(6);
            DECLARE Taxes(10) DEC(6);
            DECLARE NI(10) DEC(6);
            DECLARE Comdiv(10) DEC(6);
            DECLARE Pfddiv(10) DEC(6);
            DECLARE Mncash(1) DEC(6);
    image5: IMAGE;
----------  --.--:1  --.--:1  --.--:1  --.--:1  --.--:1
    image6: IMAGE;
----------  --.--    --.--    --.--    --.--    --.--
    image7: IMAGE;
----------  -----    -----    -----    -----    -----  TIMES
    image8: IMAGE;
----------  $-----   $-----   $-----   $-----   $-----
            DECLARE R(10) DEC(6);
            OPEN FILE(@Cranl) INPUT ;
            READ FILE(@Cranl) INTO(yrshis) ;
            READ FILE(@Cranl) INTO(Cash) ;
            READ FILE(@Cranl) INTO(Mktsec) ;
            READ FILE(@Cranl) INTO(AR) ;
            READ FILE(@Cranl) INTO(Inv) ;
            READ FILE(@Cranl) INTO(Casset) ;
            READ FILE(@Cranl) INTO(TOTCA) ;
            READ FILE(@Cranl) INTO(Prop) ;
            READ FILE(@Cranl) INTO(Acdepr) ;
            READ FILE(@Cranl) INTO(Othera) ;
            READ FILE(@Cranl) INTO(TOTASS) ;
            READ FILE(@Cranl) INTO(AP) ;
```

```
          READ FILE(@Cranl) INTO(Notes) ;
          READ FILE(@Cranl) INTO(Accrex) ;
          READ FILE(@Cranl) INTO(Cllab) ;
          READ FILE(@Cranl) INTO(TOTCL) ;
          READ FILE(@Cranl) INTO(Ltdebt) ;
          READ FILE(@Cranl) INTO(Common) ;
          READ FILE(@Cranl) INTO(Pfd) ;
          READ FILE(@Cranl) INTO(RE) ;
          READ FILE(@Cranl) INTO(TOTLNW) ;
          READ FILE(@Cranl) INTO(Sales) ;
          READ FILE(@Cranl) INTO(Cgs) ;
          READ FILE(@Cranl) INTO(GM) ;
          READ FILE(@Cranl) INTO(Operex) ;
          READ FILE(@Cranl) INTO(Deprex) ;
          READ FILE(@Cranl) INTO(OPERPR) ;
          READ FILE(@Cranl) INTO(Othinc) ;
          READ FILE(@Cranl) INTO(EBIT) ;
          READ FILE(@Cranl) INTO(Int) ;
          READ FILE(@Cranl) INTO(EBT) ;
          READ FILE(@Cranl) INTO(Taxes) ;
          READ FILE(@Cranl) INTO(NI) ;
          READ FILE(@Cranl) INTO(Comdiv) ;
          READ FILE(@Cranl) INTO(Pfddiv) ;
A10:      PUT LIST('');
          PUT LIST('RATIO');
          PUT LIST('');
          PUT LIST('                YR=  1        2        3        4        5');
          PUT LIST('');
          R=0;
          B=1;
          C=yrshis;
          R=0;
          DO i=B TO C;
          R(i)=TOTCA(i)/TOTCL(i);
          END ;
          PUT IMAGE('QUICK RATIO',R(1),R(2),R(3),R(4),R(5))(image5);
          DO i=B TO C;
          R(i)=(Cash(i)+Mktsec(i)+AR(i))/TOTCL(i);
          END ;
          PUT IMAGE('ACID TEST RATIO',R(1),R(2),R(3),R(4),R(5))(image5);
          DO i=B TO C;
          R(i)=NI(i)/Sales(i);
          END ;
          PUT IMAGE('PROFIT MARGIN',R(1),R(2),R(3),R(4),R(5))(image6);
          DO i=B TO C;
          R(i)=NI(i)/TOTASS(i);
          END ;
          PUT IMAGE('NI/ASSETS',R(1),R(2),R(3),R(4),R(5))(image6);
          DO i=B TO C;
          R(i)=NI(i)/(Common(i)+Pfd(i)+RE(i));
          END ;
          PUT IMAGE('NI/EQUITY',R(1),R(2),R(3),R(4),R(5))(image6);
          DO i=B TO C;
          R(i)=(TOTCL(i)+Ltdebt(i))/TOTASS(i);
          END ;
          PUT IMAGE('DEBT/ASSETS',R(1),R(2),R(3),R(4),R(5))(image6);
          DO i=B TO C;
          R(i)=Ltdebt(i)/(TOTASS(i)-TOTCL(i));
          END ;
          PUT IMAGE('LT DEBT/CAPL',R(1),R(2),R(3),R(4),R(5))(image6);
          DO i=B TO C;
          R(i)=(TOTCL(i)+Ltdebt(i))/(Common(i)-Pfd(i)+RE(i));
          END ;
          PUT IMAGE('DEBT/EQUITY',R(1),R(2),R(3),R(4),R(5))(image6);
          DO i=B TO C;
          R(i)=Sales(i)/365;
```

```
END ;
PUT IMAGE('DAILY SALES',R(1),R(2),R(3),R(4),R(5))(Image8);
DO i=B TO C;
R(i)=AR(i)/(Sales(i)/365);
END ;
PUT IMAGE('AR/DLY SALES',R(1),R(2),R(3),R(4),R(5))(Image7);
R=0;
DO i=B+1 TO C;
R(i)=Cgs(i)/((Inv(i)+Inv(i-1))/2);
END ;
PUT IMAGE('CGS/AVE INV',R(1),R(2),R(3),R(4),R(5))(image7);
PUT LIST('');
CLOSE FILE(@Cran1) ;
END CR3;
```

```
R4)

   CR4:     PROCEDURE ;
            DECLARE  acct CHAR(7) VAR;
            DECLARE  @Cranl FILE INPUT ;
            DECLARE Cash(10) DEC(6);
            DECLARE Mktsec(10) DEC(6);
            DECLARE AR(10) DEC(6);
            DECLARE Inv(10) DEC(6);
            ;
            DECLARE Casset(10) DEC(6);
            DECLARE TOTCA(10) DEC(6);
            DECLARE Prop(10) DEC(6);
            ;
            DECLARE Acdepr(10) DEC(6);
            DECLARE Othera(10) DEC(6);
            DECLARE TOTASS(10) DEC(6);
            DECLARE AP(10) DEC(6);
            DECLARE Notes(10) DEC(6);
            DECLARE Accrex(10) DEC(6);
            ;
            ;
            DECLARE Cliab(10) DEC(6);
            DECLARE TOTCL(10) DEC(6);
            DECLARE Ltdebt(10) DEC(6);
            DECLARE Common(10) DEC(6);
            DECLARE Pfd(10) DEC(6);
            DECLARE RE(10) DEC(6);
            DECLARE TOTLNW(10) DEC(6);
            DECLARE Sales(10) DEC(6);
            DECLARE Cgs(10) DEC(6);
            DECLARE GM(10) DEC(6);
            DECLARE Operex(10) DEC(6);
            DECLARE Deprex(10) DEC(6);
            DECLARE OPERPP(10) DEC(6);
            DECLARE Othinc(10) DEC(6);
            DECLARE EBIT(10) DEC(6);
            DECLARE Int(10) DEC(6);
            DECLARE EBT(10) DEC(6);
            DECLARE Taxes(10) DEC(6);
            DECLARE NI(10) DEC(6);
            DECLARE Comdiv(10) DEC(6);
            DECLARE Pfddiv(10) DEC(6);
            DECLARE Incash(1) DEC(6);
   Image2:  IMAGE;
-  -----    -----
            OPEN FILE(@Cranl) INPUT ;
            READ FILE(@Cranl) INTO(yrshis) ;
            READ FILE(@Cranl) INTO(Cash) ;
            READ FILE(@Cranl) INTO(Mktsec) ;
            READ FILE(@Cranl) INTO(AR) ;
            READ FILE(@Cranl) INTO(Inv) ;
            READ FILE(@Cranl) INTO(Casset) ;
            READ FILE(@Cranl) INTO(TOTCA) ;
            READ FILE(@Cranl) INTO(Prop) ;
            READ FILE(@Cranl) INTO(Acdepr) ;
            READ FILE(@Cranl) INTO(Othera) ;
            READ FILE(@Cranl) INTO(TOTASS) ;
            READ FILE(@Cranl) INTO(AP) ;
            READ FILE(@Cranl) INTO(Notes) ;
            READ FILE(@Cranl) INTO(Accrex) ;
            READ FILE(@Cranl) INTO(Cliab) ;
            READ FILE(@Cranl) INTO(TOTCL) ;
            READ FILE(@Cranl) INTO(Ltdebt) ;
            READ FILE(@Cranl) INTO(Common) ;
            READ FILE(@Cranl) INTO(Pfd) ;
```

```
          READ FILE(@Cran1) INTO(PE) ;
          READ FILE(@Cran1) INTO(TCTLNW) ;
          READ FILE(@Cran1) INTO(Sales) ;
          READ FILE(@Cran1) INTO(Cgs) ;
          READ FILE(@Cran1) INTO(GP) ;
          READ FILE(@Cran1) INTO(Operex) ;
          READ FILE(@Cran1) INTO(Deprex) ;
          READ FILE(@Cran1) INTO(OPERPR) ;
          READ FILE(@Cran1) INTO(Othinc) ;
          READ FILE(@Cran1) INTO(EBIT) ;
          READ FILE(@Cran1) INTO(Int) ;
          READ FILE(@Cran1) INTO(EBT) ;
          READ FILE(@Cran1) INTO(Taxes) ;
          READ FILE(@Cran1) INTO(NI) ;
          READ FILE(@Cran1) INTO(Comdiv) ;
          READ FILE(@Cran1) INTO(Pfddiv) ;
          B=1;
          C=yrshis;
          swi=0;
A50:      PROCEDURE (a,x,y,d);
          IF swi=9 THEN GO TO A51;
          b=0;
          c=0;
          swi=9;
A51:      ;
          IF a=0 THEN GO TO A53;
          IF a<0 THEN GO TO A52;
          c=c+a;
          PUT IMAGE(d,a,' ')(image2);
          GO TO A54;
A52:      b=b+a;
          PUT IMAGE(d,' ',abs(a))(image2);
          GO TO A54;
A53:      PUT IMAGE(d,' ',' ')(image2);
A54:      IF upcase(acct)='RE' THEN GO TO A56;
          GO TO A57;
A56:      PUT LIST('');
          PUT IMAGE('TOTAL',abs(c),abs(b))(image2);
          PUT LIST('');
A57:      ;
          END A50;
          DO i=B TO C-1;
          PUT LIST('BALANCE SHEET CHANGES');
          PUT LIST('year ',i,' to ',i+1);
          PUT LIST('ACCOUNT  SOURCE  USE');
          PUT LIST('');
          a=Cash(i)-Cash(i+1);
          acct='Cash';
          CALL A50(a,x,y,acct);
          a=Mktsec(i)-Mktsec(i+1);
          acct='Mktsec';
          CALL A50(a,x,y,acct);
          a=AR(i)-AR(i+1);
          acct='AR';
          CALL A50(a,x,y,acct);
          a=Inv(i)-Inv(i+1);
          acct='Inv';
          CALL A50(a,x,y,acct);
          a=Casset(i)-Casset(i+1);
          acct='Casset';
          CALL A50(a,x,y,acct);
          a=Prop(i)-Prop(i+1);
          acct='Prop';
          CALL A50(a,x,y,acct);
          a=Acdepr(i+1)-Acdepr(i);
          acct='Acdepr'
```

```
acct='Acdepr';
CALL A50(a,x,y,acct);
a=Othera(i)-Othera(i+1);
acct='Othera';
CALL A50(a,x,y,acct);
a=AP(i+1)-AP(i);
acct='AP';
CALL A50(a,x,y,acct);
a=Notes(i+1)-Notes(i);
acct='Notes';
CALL A50(a,x,y,acct);
a=Accrex(i+1)-Accrex(i);
acct='Accrex';
CALL A50(a,x,y,acct);
a=Cliab(i+1)-Cliab(i);
acct='Cliab';
CALL A50(a,x,y,acct);
a=Ltdebt(i+1)-Ltdebt(i);
acct='Ltdebt';
CALL A50(a,x,y,acct);
a=Common(i+1)-Common(i);
acct='Common';
CALL A50(a,x,y,acct);
a=Pfd(i+1)-Pfd(i);
acct='Pfd';
CALL A50(a,x,y,acct);
a=RE(i+1)-RE(i);
acct='RE';
CALL A50(a,x,y,acct);
PUT LIST('');
END ;
END CR4;
```

```
!(./C1)
t
0.      /C1:    PROCEDURE ;
0.              DECLARE Cash(12) DEC(6);
0.              DECLARE AR(12) DEC(6);
0.              DECLARE Inv(12) DEC(6);
0.              DECLARE Casset(12) DEC(6);
0.              DECLARE Prop(12) DEC(6);
0.              DECLARE Othera(12) DEC(6);
0.              DECLARE Sales(12) DEC(6);
0.              DECLARE FA(12) DEC(6);
0.              DECLARE CA(12) DEC(6);
5.              DECLARE TA(12) DEC(6);
0.              DECLARE DTA(12) DEC(6);
0.              DECLARE ARRAY(12) DEC(6);
0.              DECLARE  INFLO DEC(6);
0.              DECLARE  OUTFLO DEC(6);
2.              OUTFLO=0;
4.              INFLO=0;
5.              ARRAY=0;
0.              PUT LIST('Enter monthly balance sheet information on assets');
0.              PUT LIST('');
0.              DO I=1 TO 12;
0.              GET LIST(Cash(I),AR(I),Inv(I),Casset(I),Prop(),Othera(I));
0.              TA(I)=Cash(I)+AR(I)+Inv(I)+Casset(I)+Prop(I)+Othera(I);
0.              CA(I)=Cash(I)+AR(I)+Inv(I)+Casset(I);
0.              FA(I)=Prop(I)+Othera(I);
0.              END ;
0.              PUT LIST('Enter monthly Sales ');
0.              PUT LIST('');
0.              DO I=1 TO 12;
0.              GET LIST(Sales(I));
0.              ARRAY(1)=ARRAY(1)+Sales(I);
10.             END ;
10.             DO I=2 TO 12;
0.              DTA(I)=TA(I)-TA(I-1);
10.             IF DTA(I)<0 THEN INFLO=INFLO-DTA(I);
10.             IF DTA(I)>0 THEN OUTFLO=OUTFLO+DTA(I);
10.             END ;
15.             PUT LIST('');
.0.             PUT LIST('Month',' TOTAL ',' CURRENT ',' FIXED  ',' SALES');
10.             PUT LIST('      ',' ASSETS',' ASSETS  ',' ASSETS ');
30.             PUT LIST('');
10.             ;
10.             DO I=1 TO 12;
30.             PUT EDIT(I,TA(I),CA(I),FA(I),Sales(I))(Image1);
70.             END ;
10.     Image1: EDIT;
--    ------    ------    ------    ------
10.             PUT LIST('');
10.             PUT LIST('INFLO= ',INFLO);
10.             PUT LIST('OUTFLO-INFLO= ',OUTFLO-INFLO);
10.             PUT LIST('CHANGE FA= ',FA(12)-FA(1));
30.             PUT LIST('');
10.             END /C1;
```

```
2)

 WC2:    PROCEDURE ;
         DECLARE  ANS CHAR(3) VAR;
         DECLARE ARcoll(12) DEC(6);
         DECLARE SaleMS(12) DEC(6);
         DECLARE TOTREC(12) DEC(6);
         DECLARE Cshexp(12) DEC(6);
         DECLARE Cshopr(12) DEC(6);
         DECLARE Cshint(12) DEC(6);
         DECLARE Cshtax(12) DEC(6);
         DECLARE Cshdis(12) DEC(6);
         DECLARE TOTDIS(12) DEC(6);
         DECLARE NETCSH(12) DEC(6);
         DECLARE CUMCSH(12) DEC(6);
         DECLARE CSHREQ(12) DEC(6);
         DECLARE  Mincsh DEC(6);
         DECLARE  Begcsh DEC(6);
         DECLARE ARRAY(10) DEC(6);
         OUTFLO=0;
         INFLO=0;
         ARRAY=0;
         PUT LIST('Enter monthly cash budget figures');
         PUT LIST('');
         DO i=1 TO 12;
         GET LIST(ARcoll(i),SaleMS(i),Cshexp(i),Cshopr(i),Cshint(i),Cshtax(i),Cshd
         TOTREC(i)=ARcoll(i)+SaleMS(i);
         TOTDIS(i)=Cshexp(i)+Cshopr(i)+Cshint(i)+Cshtax(i)+Cshdis(i);
         NETCSH(i)=TOTREC(i)-TOTDIS(i);
         IF NETCSH(i)<0 THEN OUTFLO=OUTFLO-NETCSH(i);
         IF NETCSH(i)>0 THEN INFLO=INFLO+NETCSH(i);
         END ;
         PUT LIST('Enter beginning cash and minimum cash figures');
         PUT LIST('');
         GET LIST(Begcsh,Mincsh);
         CUMCSH(1)=Begcsh+NETCSH(1);
         CSHREQ(1)=CUMCSH(1)-Mincsh;
         DO i=2 TO 12;
         CUMCSH(i)=CUMCSH(i-1)+NETCSH(i);
         CSHREQ(i)=CUMCSH(i)-Mincsh;
         END ;
         PUT LIST('');
         PUT LIST('Do you wish to see the monthly cash budget figures?');
         PUT LIST('');
         READ INTO(ANS) ;
         IF upcase(ANS)='YES' THEN GO TO Contin;
         GO TO Endwc2;
 Contin: ;
         PUT LIST('');
         PUT LIST('MONTH','  TOTREC',' TOTDIS',' NETCSH',' CUMCSH',' Mincsh',' CSHI
         PUT LIST('');
         DO i=1 TO 12;
         PUT IMAGE(i,TOTREC(i),TOTDIS(i),NETCSH(i),CUMCSH(i),Mincsh,CSHREQ(i))(imag
         END ;
         PUT LIST('INFLO= ',INFLO);
         PUT LIST('OUTFLO-INFLO= ',OUTFLO-INFLO);
         PUT LIST('');
 Endwc2: ;
 image1: IMAGE;
------  ------  ------  ------  ------  ------
         END WC2;
```

(CR5A)

```
CR5A:   PROCEDURE ;
        DECLARE  @Proj1 FILE OUTPUT ENV( V(60)  ) ;
        DECLARE  @Cranl FILE INPUT ENV( V(60)  ) ;
        DECLARE Cash(10) DEC(6);
        DECLARE Mktsec(10) DEC(6);
        DECLARE AR(10) DEC(6);
        DECLARE Inv(10) DEC(6);
        DECLARE Passet(10) DEC(6);
        DECLARE TOTCA(10) DEC(6);
        DECLARE Prep(10) DEC(6);
        DECLARE Nclear(10) DEC(6);
        DECLARE Others(10) DEC(6);
        DECLARE TOTASS(10) DEC(6);
        DECLARE AP(10) DEC(6);
        DECLARE Notes(10) DEC(6);
        DECLARE Accrex(10) DEC(6);
        DECLARE Cliab(10) DEC(6);
        DECLARE TOTCL(10) DEC(6);
        DECLARE Ltlebt(10) DEC(6);
        DECLARE Comsn(10) DEC(6);
        DECLARE Pfl(10) DEC(6);
        DECLARE RE(10) DEC(6);
        DECLARE TOTLWE(10) DEC(6);
        DECLARE Sales(10) DEC(6);
        DECLARE Cts(10) DEC(6);
        DECLARE GI(10) DEC(6);
        DECLARE Operex(10) DEC(6);
        DECLARE Deprex(10) DEC(6);
        DECLARE OPERPR(10) DEC(6);
        DECLARE OthInc(10) DEC(6);
        DECLARE EBIT(10) DEC(6);
        DECLARE Int(10) DEC(6);
        DECLARE EBT(10) DEC(6);
        DECLARE Taxes(10) DEC(6);
        DECLARE NI(10) DEC(6);
        DECLARE Qnlty(10) DEC(6);
        DECLARE PSHty(10) DEC(6);
        DECLARE Ncash(1) DEC(6);
        DECLARE Lname(1) DEC(6);
        OPEN FILE(@Cranl) INPUT ;
        READ FILE(@Cranl) INTO(yrsbis) ;
        READ FILE(@Cranl) INTO(Cash) ;
        READ FILE(@Cranl) INTO(Mktsec) ;
        READ FILE(@Cranl) INTO(AR) ;
        READ FILE(@Cranl) INTO(Inv) ;
        READ FILE(@Cranl) INTO(Passet) ;
        READ FILE(@Cranl) INTO(TOTCA) ;
        READ FILE(@Cranl) INTO(Prep) ;
        READ FILE(@Cranl) INTO(Nclear) ;
        READ FILE(@Cranl) INTO(Others) ;
        READ FILE(@Cranl) INTO(TOTASS) ;
        READ FILE(@Cranl) INTO(AP) ;
        READ FILE(@Cranl) INTO(Notes) ;
        READ FILE(@Cranl) INTO(Accrex) ;
        READ FILE(@Cranl) INTO(Cliab) ;
        READ FILE(@Cranl) INTO(TOTCL) ;
        READ FILE(@Cranl) INTO(Ltlebt) ;
        READ FILE(@Cranl) INTO(Comsn) ;
        READ FILE(@Cranl) INTO(Pfl) ;
        READ FILE(@Cranl) INTO(RE) ;
        READ FILE(@Cranl) INTO(TOTLWE) ;
        READ FILE(@Cranl) INTO(Sales) ;
        READ FILE(@Cranl) INTO(Cts) ;
```

```
            READ FILE(QCrapl) INTO(Cit) ;
            READ FILE(QCrapl) INTO(Operex) ;
            READ FILE(QCrapl) INTO(Deprex) ;
            READ FILE(QCrapl) INTO(APEPAY) ;
            READ FILE(QCrapl) INTO(Othinc) ;
            READ FILE(QCrapl) INTO(EBIT) ;
            READ FILE(QCrapl) INTO(Int) ;
            READ FILE(QCrapl) INTO(EBT) ;
            READ FILE(QCrapl) INTO(Taxes) ;
            READ FILE(QCrapl) INTO(NI) ;
            READ FILE(QCrapl) INTO(Cashdiv) ;
            READ FILE(QCrapl) INTO(PSTdiv) ;
            READ FILE(QCrapl) INTO(yrspro) ;
            CLOSE FILE(QCrapl) ;
A14:        DO i=2 TO yrshis;
            Sales(1)=Sales(1)+Sales(i);
            Cgs(1)=Cgs(1)+Cgs(i);
            Operex(1)=Operex(1)+Operex(i);
            Deprex(1)=Deprex(1)+Deprex(i);
            Othinc(1)=Othinc(1)+Othinc(i);
            AP(1)=AP(1)+AP(i);
            END A14;
            PUT LIST(' ');
            PUT LIST('');
            DO i=yrshis+1 TO yrshis+yrspro;
            Cgs(i)=trunc(Sales(i)*(Cgs(1)/Sales(1)));
            Operex(i)=trunc(Sales(i)*(Operex(1)/Sales(1)));
            Deprex(i)=trunc(Sales(i)*(Deprex(1)/Sales(1)));
            Othinc(i)=trunc(Sales(i)*(Othinc(1)/Sales(1)));
            GET LIST(F1,F2,F3);
            AR(i)=TRUNC(AR(i-1)+(Sales(i)-Sales(i-1))*F2);
            Inv(i)=TRUNC(Inv(i-1)+(Sales(i)-Sales(i-1))*F3);
            Accdepr(i)=Accdepr(i-1)+Deprex(i);
            AP(i)=trunc(Cgs(i)*(AP(1)/Cgs(1)));
            Accprex(i)=trunc(Cgs(i)*(Accprex(yrshis)/Cgs(yrshis)));
            Ltdebt(i)=Ltdebt(yrshis);
            END ;
            OPEN FILE(QProfil) OUTPUT ;
            WRITE FILE(QProfil) FROM(yrshis) ;
            WRITE FILE(QProfil) FROM(Cash) ;
            WRITE FILE(QProfil) FROM(Mktsec) ;
            WRITE FILE(QProfil) FROM(AR) ;
            WRITE FILE(QProfil) FROM(Inv) ;
            WRITE FILE(QProfil) FROM(Passet) ;
            WRITE FILE(QProfil) FROM(Ppe) ;
            WRITE FILE(QProfil) FROM(Accdepr) ;
            WRITE FILE(QProfil) FROM(Othera) ;
            WRITE FILE(QProfil) FROM(AP) ;
            WRITE FILE(QProfil) FROM(Opex) ;
            WRITE FILE(QProfil) FROM(Accprex) ;
            WRITE FILE(QProfil) FROM(Clab) ;
            WRITE FILE(QProfil) FROM(Ltdebt) ;
            WRITE FILE(QProfil) FROM(Common) ;
            WRITE FILE(QProfil) FROM(Pfd) ;
            WRITE FILE(QProfil) FROM(RE) ;
            WRITE FILE(QProfil) FROM(Sales) ;
            WRITE FILE(QProfil) FROM(Cgs) ;
            WRITE FILE(QProfil) FROM(Operex) ;
            WRITE FILE(QProfil) FROM(Deprex) ;
            WRITE FILE(QProfil) FROM(Othinc) ;
            WRITE FILE(QProfil) FROM(Int) ;
            WRITE FILE(QProfil) FROM(Taxes) ;
            WRITE FILE(QProfil) FROM(Cashdiv) ;
            WRITE FILE(QProfil) FROM(PSTdiv) ;
            WRITE FILE(QProfil) FROM(yrspro) ;
            CLOSE FILE(QProfil) ;
```

```
))•                    END GRSA;
```

(0358)

```
.     0358:   PROCEDURE ;
.             DECLARE  JProfl FILE OUTPUT ENV( V(80)  ) ;
.             DECLARE  JCrapl FILE INPUT ENV( V(80)  ) ;
.             DECLARE Cash(10) DEC(6);
.             DECLARE Mktsec(10) DEC(6);
.             DECLARE AR(10) DEC(6);
.             DECLARE Inv(10) DEC(6);
.             DECLARE Casset(10) DEC(6);
.             DECLARE TOTCA(10) DEC(6);
.             DECLARE Prep(10) DEC(6);
.             DECLARE Aclear(10) DEC(6);
.             DECLARE Others(10) DEC(6);
.             DECLARE TOTASS(10) DEC(6);
.             DECLARE AP(10) DEC(6);
.             DECLARE Notes(10) DEC(6);
.             DECLARE Accrex(10) DEC(6);
.             DECLARE Cliab(10) DEC(6);
.             DECLARE TOTCL(10) DEC(6);
.             DECLARE Ltdebt(10) DEC(6);
.             DECLARE Comcon(10) DEC(6);
.             DECLARE PFI(10) DEC(6);
.             DECLARE RE(10) DEC(6);
.             DECLARE TOTLWH(10) DEC(6);
.             DECLARE Sales(10) DEC(6);
.             DECLARE Cgs(10) DEC(6);
.             DECLARE GM(10) DEC(6);
.             DECLARE Operex(10) DEC(6);
.             DECLARE Deprex(10) DEC(6);
.             DECLARE OPEXP(10) DEC(6);
.             DECLARE Othinc(10) DEC(6);
.             DECLARE EBIT(10) DEC(6);
.             DECLARE Int(10) DEC(6);
.             DECLARE EBT(10) DEC(6);
.             DECLARE Taxes(10) DEC(6);
.             DECLARE NI(10) DEC(6);
.             DECLARE Cashiv(10) DEC(6);
.             DECLARE PFDiv(10) DEC(6);
.             DECLARE Incash(1) DEC(6);
.             DECLARE Lmart(1) DEC(6);
.             OPEN FILE(JCrapl) INPUT ;
.             READ FILE(JCrapl) INTO(yrshis) ;
.             READ FILE(JCrapl) INTO(Cash) ;
.             READ FILE(JCrapl) INTO(Mktsec) ;
.             READ FILE(JCrapl) INTO(AR) ;
.             READ FILE(JCrapl) INTO(Inv) ;
.             READ FILE(JCrapl) INTO(Casset) ;
.             READ FILE(JCrapl) INTO(TOTCA) ;
.             READ FILE(JCrapl) INTO(Prep) ;
.             READ FILE(JCrapl) INTO(Aclear) ;
.             READ FILE(JCrapl) INTO(Others) ;
.             READ FILE(JCrapl) INTO(TOTASS) ;
.             READ FILE(JCrapl) INTO(AP) ;
.             READ FILE(JCrapl) INTO(Notes) ;
.             READ FILE(JCrapl) INTO(Accrex) ;
.             READ FILE(JCrapl) INTO(Cliab) ;
.             READ FILE(JCrapl) INTO(TOTCL) ;
.             READ FILE(JCrapl) INTO(Ltdebt) ;
.             READ FILE(JCrapl) INTO(Comcon) ;
.             READ FILE(JCrapl) INTO(PFI) ;
.             READ FILE(JCrapl) INTO(RE) ;
.             READ FILE(JCrapl) INTO(TOTLWH) ;
.             READ FILE(JCrapl) INTO(Sales) ;
.             READ FILE(JCrapl) INTO(Cgs) ;
.             READ FILE(JCrapl) INTO(GM) ;
```

```
         READ FILE(@Cran1) INTO(Operex) ;
         READ FILE(@Cran1) INTO(Deprex) ;
         READ FILE(@Cran1) INTO(OPERPRO) ;
         READ FILE(@Cran1) INTO(Othinc) ;
         READ FILE(@Cran1) INTO(EBIT) ;
         READ FILE(@Cran1) INTO(Int) ;
         READ FILE(@Cran1) INTO(EBT) ;
         READ FILE(@Cran1) INTO(Taxes) ;
         READ FILE(@Cran1) INTO(NI) ;
         READ FILE(@Cran1) INTO(Comdiv) ;
         READ FILE(@Cran1) INTO(Pfdiv) ;
         READ FILE(@Cran1) INTO(yrspro) ;
         CLOSE FILE(@Cran1) ;
A14:     DO i=2 TO yrshis;
         Sales(1)=Sales(1)+Sales(i);
         Cgs(1)=Cgs(1)+Cgs(i);
         Operex(1)=Operex(1)+Operex(i);
         Deprex(1)=Deprex(1)+Deprex(i);
         Othinc(1)=Othinc(1)+Othinc(i);
         AP(1)=AP(1)+AP(i);
         END A14;
         PUT LIST(' ');
         PUT LIST('');
         DO i=yrshis+1 TO yrshis+yrspro;
         Cgs(i)=trunc(Sales(i)*(Cgs(I)/Sales(I)));
         Operex(i)=trunc(Sales(i)*(Operex(1)/Sales(1)));
         Deprex(i)=trunc(Sales(i)*(Deprex(1)/Sales(1)));
         Othinc(i)=trunc(Sales(i)*(Othinc(I)/Sales(I)));
         GET LIST(F1,F2,F3);
         Casset(i)=TRUNC(Casset(i-1)+(Sales(i)-Sales(i-1))*F2);
         AR(i)=TRUNC(AR(i-1)+(Sales(i)-Sales(i-1))*F2);
         Inv(i)=TRUNC(Inv(i-1)+(Sales(i)-Sales(i-1))*F2);
         Acdepr(i)=Acdepr(i-1)+Deprex(i);
         AP(i)=trunc(Cgs(i)*(AP(I)/Cgs(I)));
         Accrex(i)=trunc(Cgs(i)*(Accrex(yrshis)/Cgs(yrshis)));
         Ltdebt(i)=Ltdebt(yrshis);
         END ;
         OPEN FILE(@Proj1) OUTPUT ;
         WRITE FILE(@Proj1) FROM(yrshis) ;
         WRITE FILE(@Proj1) FROM(Cash) ;
         WRITE FILE(@Proj1) FROM(Mktsec) ;
         WRITE FILE(@Proj1) FROM(AR) ;
         WRITE FILE(@Proj1) FROM(Inv) ;
         WRITE FILE(@Proj1) FROM(Casset) ;
         WRITE FILE(@Proj1) FROM(Prop) ;
         WRITE FILE(@Proj1) FROM(Acdepr) ;
         WRITE FILE(@Proj1) FROM(Othera) ;
         WRITE FILE(@Proj1) FROM(AP) ;
         WRITE FILE(@Proj1) FROM(Notes) ;
         WRITE FILE(@Proj1) FROM(Accrex) ;
         WRITE FILE(@Proj1) FROM(Cliab) ;
         WRITE FILE(@Proj1) FROM(Ltdebt) ;
         WRITE FILE(@Proj1) FROM(Common) ;
         WRITE FILE(@Proj1) FROM(Pfd) ;
         WRITE FILE(@Proj1) FROM(RE) ;
         WRITE FILE(@Proj1) FROM(Sales) ;
         WRITE FILE(@Proj1) FROM(Cgs) ;
         WRITE FILE(@Proj1) FROM(Operex) ;
         WRITE FILE(@Proj1) FROM(Deprex) ;
         WRITE FILE(@Proj1) FROM(Othinc) ;
         WRITE FILE(@Proj1) FROM(Int) ;
         WRITE FILE(@Proj1) FROM(Taxes) ;
         WRITE FILE(@Proj1) FROM(Comdiv) ;
         WRITE FILE(@Proj1) FROM(Pfdiv) ;
         WRITE FILE(@Proj1) FROM(yrspro) ;
         CLOSE FILE(@Proj1) ;
```

```
pa!(CR5C)
ist
  1.     CR5C:   PROCEDURE ;
  2.             DECLARE  @Proj1 FILE OUTPUT ENV( V(80)  ) ;
  5.             DECLARE  @Cran1 FILE INPUT ENV( V(80)  ) ;
  6.             DECLARE Cash(10) DEC(6);
  8.             DECLARE Mktsec(10) DEC(6);
 10.             DECLARE AR(10) DEC(6);
 12.             DECLARE Inv(10) DEC(6);
 16.             DECLARE Casset(10) DEC(6);
 18.             DECLARE TOTCA(10) DEC(6);
 20.             DECLARE Prep(10) DEC(6);
 24.             DECLARE Acloar(10) DEC(6);
 26.             DECLARE Othera(10) DEC(6);
 28.             DECLARE TOTASS(10) DEC(6);
 30.             DECLARE AP(10) DEC(6);
 32.             DECLARE Notes(10) DEC(6);
 34.             DECLARE Accrex(10) DEC(6);
 40.             DECLARE CLiab(10) DEC(6);
 42.             DECLARE TOTCL(10) DEC(6);
 44.             DECLARE Ltdebt(10) DEC(6);
 46.             DECLARE Comm(10) DEC(6);
 48.             DECLARE PSI(10) DEC(6);
 50.             DECLARE RE(10) DEC(6);
 52.             DECLARE TOTLNW(10) DEC(6);
 54.             DECLARE Sales(10) DEC(6);
 56.             DECLARE Cos(10) DEC(6);
 58.             DECLARE GM(10) DEC(6);
 60.             DECLARE Operex(10) DEC(6);
 62.             DECLARE Deprex(10) DEC(6);
 64.             DECLARE OPEXP(10) DEC(6);
 66.             DECLARE Othinc(10) DEC(6);
 68.             DECLARE EBIT(10) DEC(6);
 70.             DECLARE Int(10) DEC(6);
 72.             DECLARE EBT(10) DEC(6);
 74.             DECLARE Taxes(10) DEC(6);
 76.             DECLARE NI(10) DEC(6);
 78.             DECLARE Comliv(10) DEC(6);
 80.             DECLARE PSLiv(10) DEC(6);
 82.             DECLARE Incash(1) DEC(6);
100.             DECLARE Lnamt(1) DEC(6);
200.             OPEN FILE(@Cran1) INPUT ;
202.             READ FILE(@Cran1) INTO(yrshis) ;
204.             READ FILE(@Cran1) INTO(Cash) ;
206.             READ FILE(@Cran1) INTO(Mktsec) ;
208.             READ FILE(@Cran1) INTO(AR) ;
209.             READ FILE(@Cran1) INTO(Inv) ;
210.             READ FILE(@Cran1) INTO(Casset) ;
212.             READ FILE(@Cran1) INTO(TOTCA) ;
214.             READ FILE(@Cran1) INTO(Prep) ;
216.             READ FILE(@Cran1) INTO(Acloar) ;
218.             READ FILE(@Cran1) INTO(Othera) ;
220.             READ FILE(@Cran1) INTO(TOTASS) ;
222.             READ FILE(@Cran1) INTO(AP) ;
224.             READ FILE(@Cran1) INTO(Notes) ;
226.             READ FILE(@Cran1) INTO(Accrex) ;
228.             READ FILE(@Cran1) INTO(CLiab) ;
230.             READ FILE(@Cran1) INTO(TOTCL) ;
232.             READ FILE(@Cran1) INTO(Ltdebt) ;
234.             READ FILE(@Cran1) INTO(Comm) ;
236.             READ FILE(@Cran1) INTO(PSI) ;
238.             READ FILE(@Cran1) INTO(RE) ;
240.             READ FILE(@Cran1) INTO(TOTLNW) ;
242.             READ FILE(@Cran1) INTO(Sales) ;
244.             READ FILE(@Cran1) INTO(Cos) ;
246.             READ FILE(@Cran1) INTO(GM) ;
```

```
248.              READ FILE(@Cranl) PUT(Operex) ;
250.              READ FILE(@Cranl) PUT(Deprex) ;
252.              READ FILE(@Cranl) PUT(OthInc) ;
254.              READ FILE(@Cranl) PUT(Othinc) ;
256.              READ FILE(@Cranl) PUT(DBIT) ;
258.              READ FILE(@Cranl) PUT(Int) ;
260.              READ FILE(@Cranl) PUT(EQT) ;
262.              READ FILE(@Cranl) PUT(Taxes) ;
264.              READ FILE(@Cranl) PUT(NI) ;
266.              READ FILE(@Cranl) PUT(Cashdiv) ;
268.              READ FILE(@Cranl) PUT(RetEarn) ;
270.              READ FILE(@Cranl) PUT(yrspro) ;
290.              CLOSE FILE(@Cranl) ;
435.    A14:      DO I=2 TO yrshis;
440.              Sales(1)=Sales(1)+Sales(I);
445.              Cgs(1)=Cgs(1)+Cgs(I);
450.              Operex(1)=Operex(1)+Operex(I);
455.              Deprex(1)=Deprex(1)+Deprex(I);
460.              Othinc(1)=Othinc(1)+Othinc(I);
475.              Int(1)=Int(1)+Int(I);
487.              AP(1)=AP(1)+AP(I);
500.              END A14;
502.              PUT LIST(' ');
503.              PUT LIST('');
505.              DO I=yrshis+1 TO yrshis+yrspro;
510.              Cgs(I)=trunc(Sales(I)*(Cgs(1)/Sales(1)));
520.              Operex(I)=trunc(Sales(I)*(Operex(1)/Sales(1)));
525.              Deprex(I)=trunc(Sales(I)*(Deprex(1)/Sales(1)));
535.              Othinc(I)=trunc(Sales(I)*(Othinc(1)/Sales(1)));
545.              GET LIST(F1,F2,F3);
555.              Cassat(I)=TRUNC(Cassat(I-1)+(Sales(I)-Sales(I-1))*F2);
565.              AR(I)=TRUNC(AR(I-1)+(Sales(I)-Sales(I-1))*F2);
580.              Inv(I)=TRUNC(Inv(I-1)+(Sales(I)-Sales(I-1))*F2);
595.              Ppex(I)=TRUNC(Ppex(I-1)+(Sales(I)-Sales(I-1))*F3);
596.              Aclear(I)=trunc(Aclear(I-1)+(Sales(I)-Sales(I-1))*F3);
610.              Aclear(I)=Aclear(I-1)+Deprex(I);
625.              AP(I)=trunc(Cgs(I)*(AP(1)/Cgs(1)));
635.              Accrex(I)=trunc(Cgs(I)*(Accrex(yrshis)/Cgs(yrshis)));
650.              Ltdebt(I)=Ltdebt(yrshis);
670.              END ;
700.              OPEN FILE(@Proj1) OUTPUT ;
705.              WRITE FILE(@Proj1) FROM(yrshis) ;
711.              WRITE FILE(@Proj1) FROM(Cash) ;
715.              WRITE FILE(@Proj1) FROM(Mktsec) ;
720.              WRITE FILE(@Proj1) FROM(AR) ;
725.              WRITE FILE(@Proj1) FROM(Inv) ;
730.              WRITE FILE(@Proj1) FROM(Cassat) ;
740.              WRITE FILE(@Proj1) FROM(Ppen) ;
745.              WRITE FILE(@Proj1) FROM(Aclear) ;
750.              WRITE FILE(@Proj1) FROM(Othera) ;
760.              WRITE FILE(@Proj1) FROM(AP) ;
765.              WRITE FILE(@Proj1) FROM(Notes) ;
770.              WRITE FILE(@Proj1) FROM(Accrex) ;
775.              WRITE FILE(@Proj1) FROM(Cliab) ;
785.              WRITE FILE(@Proj1) FROM(Ltdebt) ;
790.              WRITE FILE(@Proj1) FROM(Common) ;
795.              WRITE FILE(@Proj1) FROM(PSH) ;
800.              WRITE FILE(@Proj1) FROM(RE) ;
810.              WRITE FILE(@Proj1) FROM(Sales) ;
815.              WRITE FILE(@Proj1) FROM(Cgs) ;
825.              WRITE FILE(@Proj1) FROM(Operex) ;
830.              WRITE FILE(@Proj1) FROM(Deprex) ;
840.              WRITE FILE(@Proj1) FROM(Othinc) ;
850.              WRITE FILE(@Proj1) FROM(Int) ;
860.              WRITE FILE(@Proj1) FROM(Taxes) ;
870.              WRITE FILE(@Proj1) FROM(Cashdiv) ;
```

```
875.            WRITE FILE(QProfl) FROM(Profity) ;
880.            WRITE FILE(QProfl) FROM(yrspro) ;
885.            CLOSE FILE(QProfl) ;
890.            END GR5C;
```

```
load(CR5D)
list
  1.    CR5D:   PROCEDURE ;
  5.            DECLARE  @Proj1 FILE INPUT ;
  6.            DECLARE Cash(10) DEC(6);
  8.            DECLARE Mktsec(10) DEC(6);
 10.            DECLARE AR(10) DEC(6);
 12.            DECLARE Inv(10) DEC(6);
 14.            ;
 16.            DECLARE Casset(10) DEC(6);
 18.            DECLARE TOTCA(10) DEC(6);
 20.            DECLARE Prop(10) DEC(6);
 22.            ;
 24.            DECLARE Accdepr(10) DEC(6);
 26.            DECLARE Othera(10) DEC(6);
 28.            DECLARE TOTASS(10) DEC(6);
 30.            DECLARE AP(10) DEC(6);
 32.            DECLARE Notes(10) DEC(6);
 34.            DECLARE Accrex(10) DEC(6);
 36.            ;
 38.            ;
 40.            DECLARE Cliab(10) DEC(6);
 42.            DECLARE TOTCL(10) DEC(6);
 44.            DECLARE Ltdebt(10) DEC(6);
 46.            DECLARE Common(10) DEC(6);
 48.            DECLARE Pfl(10) DEC(6);
 50.            DECLARE RE(10) DEC(6);
 52.            DECLARE TOTLWI(10) DEC(6);
 54.            DECLARE Sales(10) DEC(6);
 56.            DECLARE Cgs(10) DEC(6);
 58.            DECLARE GI(10) DEC(6);
 60.            DECLARE Opexp(10) DEC(6);
 62.            DECLARE Depexp(10) DEC(6);
 64.            DECLARE OPERPR(10) DEC(6);
 66.            DECLARE Othinc(10) DEC(6);
 68.            DECLARE EBIT(10) DEC(6);
 70.            DECLARE Int(10) DEC(6);
 72.            DECLARE EBT(10) DEC(6);
 74.            DECLARE Taxes(10) DEC(6);
 76.            DECLARE NI(10) DEC(6);
 78.            DECLARE Cpdiv(10) DEC(6);
 80.            DECLARE Pfdiv(10) DEC(6);
 82.            DECLARE Incash(1) DEC(6);
 84.            DECLARE Yeal(10) DEC(6);
100.    Label1: IMAGE;
------ $------
102.    Mate2: IMAGE;
------ ------
200.            OPEN FILE(@Proj1) INPUT ;
202.            READ FILE(@Proj1) INTO(yrshis) ;
204.            READ FILE(@Proj1) INTO(Cash) ;
206.            READ FILE(@Proj1) INTO(Mktsec) ;
208.            READ FILE(@Proj1) INTO(AR) ;
210.            READ FILE(@Proj1) INTO(Inv) ;
212.            READ FILE(@Proj1) INTO(Casset) ;
214.            READ FILE(@Proj1) INTO(Prop) ;
216.            READ FILE(@Proj1) INTO(Accdepr) ;
218.            READ FILE(@Proj1) INTO(Othera) ;
220.            READ FILE(@Proj1) INTO(AP) ;
222.            READ FILE(@Proj1) INTO(Notes) ;
224.            READ FILE(@Proj1) INTO(Accrex) ;
226.            READ FILE(@Proj1) INTO(Cliab) ;
228.            READ FILE(@Proj1) INTO(Ltdebt) ;
230.            READ FILE(@Proj1) INTO(Common) ;
232.            READ FILE(@Proj1) INTO(Pfd) ;
234.            READ FILE(@Proj1) INTO(RE) ;
```

```
235.            READ FILE(JProj1) INTO(Sales) ;
238.            READ FILE(JProj1) INTO(Cgs) ;
240.            READ FILE(JProj1) INTO(Sgenex) ;
242.            READ FILE(JProj1) INTO(Depnex) ;
244.            READ FILE(JProj1) INTO(Othinc) ;
246.            READ FILE(JProj1) INTO(Int) ;
248.            READ FILE(JProj1) INTO(Taxes) ;
250.            READ FILE(JProj1) INTO(Comdiv) ;
252.            READ FILE(JProj1) INTO(Pfddiv) ;
254.            READ FILE(JProj1) INTO(yrspro) ;
256.            CLOSE FILE(JProj1) ;
300.            DO i=2 TO yrshis+yrspro;
305.            TOTCA(i)=Cash(i)+Mktsec(i)+Inv(i)+AR(i)+Cpaid(i);
310.            TOTAS(i)=TOTCA(i)+Ppe(i)+Othera(i)-Aclear(i);
315.            TOTCL(i)=AP(i)+Notes(i)+Accrex(i)+Cltab(i);
325.            GM(i)=Sales(i)-Cgs(i);
330.            OPERPR(i)=GM(i)-Sgenex(i)-Depnex(i);
335.            EBIT(i)=OPERPR(i)+Othinc(i);
340.            EBT(i)=EBIT(i)-Int(i);
341.            Taxes(i)=trunc(.40*EBT(i));
345.            NI(i)=EBT(i)-Taxes(i);
347.            RE(i)=RE(i-1)+NI(i)-Comdiv(i)-Pfddiv(i);
348.            TOTLIA(i)=TOTCL(i)+Ltdebt(i)+Common(i)+Pfd(i)+RE(i);
349.            Dee(i)=TOTASS(i)-TOTLIA(i);
350.            END ;
500.            DO i=yrshis+1 TO yrspro+yrshis;
501.            PUT LIST('');
502.            PUT LIST('YR= ',i,' CASH FLOW');
503.            PUT LIST('');
504.            PUT LIST('');
506.            PUT IMAGE('NI',NI(i))(Image1);
508.            PUT IMAGE('Int',Int(i))(Image2);
510.            PUT IMAGE('Depr',Depnex(i))(Image2);
512.            PUT LIST('--------------------');
514.            PUT IMAGE('Cash',NI(i)+Int(i)+Depnex(i))(Image2);
516.            PUT LIST('');
520.            PUT LIST(Comdiv(i));
522.            PUT LIST(Pfddiv(i));
524.            PUT LIST('');
526.            PUT LIST(NI(i)+Depnex(i)+Int(i)-Comdiv(i)-Pfddiv(i));
550.            PUT LIST('');
600.            END ;
999.            END CR5D;
```

(C25S)

```
1.      C25S:   PURPOSE:
2.              DECLARE P(10);
3.              PUT LIST('');
4.              PUT LIST('Enter the purpose of the financing');
5.              PUT LIST('');
6.              PUT LIST('1=financing WC');
7.              PUT LIST('2=financing WC & PUC');
8.              PUT LIST('3=financing WC,PUC, & EC');
9.              GET LIST(purpos);
10.             PUT LIST('');
11.             PUT LIST('Enter the amount of financing(loan) for each purpose
12.             PUT LIST('');
13.             GET LIST(WCCL,PUCL,ECL);
14.     PURP:   PUT LIST('');
15.             PUT LIST('Financing for seasonal fluctuations = ',WCCL);
16.             PUT LIST('');
17.             IF purpos=1 THEN GO TO XIT;
18.     PUC:    PUT LIST('Financing PUC');
19.             PUT LIST('');
20.             PUT LIST('Enter the interest rate');
21.             GET LIST(Lnint);
22.             PUT LIST('');
23.             PUT LIST('Principal = ',PUCL);
24.             PUT LIST('Interest = ',PUCL*Lnint);
25.             PUT LIST('');
26.             IF purpos=2 THEN GO TO XIT;
27.     EC:     PUT LIST('Financing fixed capital');
28.             PUT LIST('');
29.             PUT LIST('Enter the interest rate');
30.             GET LIST(Lnint);
31.             PUT LIST('');
32.             DO i=1 TO 10;
33.             A=Lnint*(1+Lnint)**i;
34.             B=(1+Lnint)**i-1;
35.             P(i)=A/B*ECL;
36.             PUT LIST('YRS= ',i,' LEVEL PMT = ',P(i));
37.             END ;
38.     XIT:    ;
39.             END C25S;
```

APPENDIX B

SAMPLE EXECUTION

```
in(bus1,12243)
SWORD: [illegible]
)D AFTERNOON; USER 01; TIME  14:44:42  4/19/74.
d(GRAHL,REU)
!

ICEDURE TO PERFORM A STEPWISE COMMERCIAL CREDIT ANALYSIS

:er the number of years of historical statements to be keyed in
:his


:er historical data for year  1

:er balance sheet data

:h(1)
)00
:sec(1)

:1)
)00
/(1)
5000
sset(1)

)0(1)
)00
depr(1)

)era(1)
)0
:1)
)00
:es(1)

:rex(1)
)00
lab(1)

lebt(1)
)00
)ren(1)
)00
!(1)

(1)
5500
```

ter income statement data

les(1)
0000
s(1)
0000
erex(1)
000
prex(1)
00
hinc(1)

t(1)
00
xes(1)
000

ter dividends paid
pdiv(1)

ddiv(1)

ter historical data for year 2

ter balance sheet data

sh(2)
000
tsec(2)

(2)
0000
v(2)
0000
sset(2)

op(2)
000
lepr(2)

hera(2)

'(2)
000
tes(2)
000
crex(2)
300
lab(2)

```
sht(2)
)0
ion(2)
)0
(2)

2)
)00

er income statement data

es(2)
)00
(2)
)00
rex(2)
)00
rex(2)

inc(2)

(2)

es(2)
00

er dividends paid
div(2)

div(2)

er historical data for year  3

er balance sheet data

s(3)
00
sec(3)

3)
000
(3)
000
set(3)

s(3)
000
abr(3)

ore(3)
```

3)
100

es(3)
10

rex(3)
10

eb(3)

ebt(3)
10

ion(3)
10

(3)

3)
500

er income statement data

es(3)
000
(3)
000
rex(3)
000
rex(3)
00
inc(3)
0
(3)
0
es(3)
00

er dividends paid
liv(3)

liv(3)

er minimum cash
ash(1)
00

er the number of years of pro forma statements to be created
ears

er the projected sales for 5 years
les(5)

;s(5)			
;s(6)			
;s(7)			
;s(9)			

VICE SHEET YR 1 INCOME STATEMENT

	$ 22000	Sales	$ 800000
sec	0	Cgs	619000
	90000	GM	181000
	105000	Operex	92000
set	0	Deprex	8000
CA	217000	OPERPR	83000
	72000	Othinc	0
epr	0	EBIT	83000
era	1500	Int	8000
NGS	206500	EBT	75000
		Taxes	38000
	60000	NI	37000
es	0		
rex	18000		
sh	0		
CL	78000		
sht	17000		
ppn	75000		
	0		
	126500		
LTL	206500		

VICE SHEET YR 2 INCOME STATEMENT

	$ 14000	Sales	$ 850000
sec	0	Cgs	653000
	100000	GM	197000
	180000	Operex	100000
set	0	Deprex	9000
CA	294000	OPERPR	88000
	99000	Othinc	0
epr	0	EBIT	88000
era	800	Int	8000
NGS	393800	EBT	80000
		Taxes	41000
	99000	NI	39000
es	39000		
rex	22300		

)	0
.	151300
)t	15000
)n	75000
	0
	151500
N/	303800

ICE SHEET YR 3 INCOME STATEMENT

	$ 12000	Sales	$ 900000
)c	0	Cgs	708000
	130000	GM	192000
	300000	Operex	107000
)t	0	Deprex	13000
)	442000	OPERPR	72000
	147000	Othinc	0
)r	0	EBIT	72000
)e	100	Int	9000
)G	589100	EBT	63000
		Taxes	30000
	135000	NI	33000
;	98000		
)x	31600		
)	0		
.	314600		
)t	15000		
)n	75000		
	0		
	184500		
N/	589100		

)

	YR= 1	2	3	4	5
RATIO	2.78:1	1.94:1	1.52:1	0. :1	0. :1
TEST RATIO	1.44:1	.75:1	.45:1	0. :1	0. :1
T MARGIN	.05	.05	.04	0.	0.
SSETS	.12	.10	.06	0.	0.
UITY	.18	.17	.13	0.	0.
ASSETS	.32	.40	.56	0.	0.
BT/CAPL	.03	.07	.05	0.	0.
EQUITY	.47	.71	1.27	0.	0.
SALES	$ 2102	$ 2322	$ 2466	$ 0	$ 0
Y SALES	41	43	53	0	0 TIMES
VE INV	0	5	3	0	0 TIMES

'CE SHEET CHANGES
1 to 2

'MT	SOURCE	USE
	3300	
ec		
		10000
		75000
et		
		21000
pr		
ra	700	
	30000	
s	30000	
ex	4300	
b		
bt		1000
on		
	25000	
L	*****	*****

UCE SHEET CHANGES
2 to 3

MT	SOURCE	USE
	2000	
ec		
		30000
		*****
et		
		48000
pr		
ra	700	
	95000	
s	50000	
ex	9300	
b		
bt		1000
on		
	33000	
L	*****	*****

r monthly balance sheet information on assets

(1)

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.)
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:t(1)

 1)
'a(1)

 2)
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:)
:0
:t(2)

:2)
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:3)
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5)
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:4)
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:t(4)

(4)
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'a(4)

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(9)

9)

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(10)

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1)

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(11)

.1)

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2)

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(12)

12)

(12)

monthly Sales

(1)

(2)

0

(3)

0

(4)

0

5)

6)

7)

8)

9)

10)

11)

12)

TOTAL ASSETS	CURRENT ASSETS	FIXED ASSETS	SALES
296500	217000	79500	50000
304500	223000	81500	100000
325500	240000	85500	150000
343500	255000	88500	200000
320500	239000	81500	100000
319500	227000	92500	100000
345500	252000	93500	50000
356500	262000	94500	50000
367500	272000	95500	50000
373500	277000	96500	50000
395000	283000	112000	50000
394500	294000	100500	50000

10 thru...
.45
.7
.1

monthly cash budget figures

1(1)

6(1)

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1)

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all(5)
aug(5)
exp(5)
por(5)
int(5)
tax(5)
dis(5)
all(6)
aug(6)
exp(6)
por(6)
int(6)
tax(6)
dis(6)
all(7)
aug(7)
exp(7)
por(7)
int(7)
tax(7)
dis(7)
all(8)
aug(8)
exp(8)
por(8)
int(8)

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I(10)

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E(10)

<(10)

;(10)

I(11)

:(11)

>(11)

r(11)

t(11)

x(11)

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I(12)

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+(12)

beginning cash and minimum cash figures

h

h

u wish to see the monthly cash budget figures?

TOTREC	TOTDIS	NETCSH	CUMCSH	Mincsh	COMPEN
60000	81000	-21000	-1000	15000	-16000
105000	159000	-54000	-53000	15000	-69000
155000	207000	-52000	******	15000	******
175000	81000	94000	-11000	15000	-26000
180000	153500	26500	15500	15000	500
90000	115000	-25000	-9500	15000	-24500
55000	60000	-5000	-14500	15000	-29500
60000	60000	0	-14500	15000	-29500
65000	70000	-5000	-19500	15000	-34500
70000	75000	-5000	-24500	15000	-39500
75000	75000	0	-24500	15000	-39500
80000	85000	-5000	-29500	15000	-44500

)= 120500

LO-LUELO= 51500

r purpose of loan as shown below
finance variable current assets
finance permanent current assets
finance fixed assets

os

CASH FLOW

$ 41157
9000
10705
60862
0
0
60862

CASH FLOW

$ 41912
9000
10382
61794
0
0
61794

CASH FLOW

$ 42416
9000
10099
62415
0
0
62415

CASH FLOW

$ 43171
2000
11176

63347

0
0

63347

CASH FLOW

$ 44170
2000
11411

64590

0
0

64590

the purpose of the financing

ancing VHC
ancing VHC & PHC
ancing VHC,PHC, & EC
s

the amount of financing(loan) for each purpose

ncing for seasonal fluctuations = 80000

```
cing PMC

 the interest rate


inal =  45000
est =  4500

cing fixed capital

 the interest rate


 1  LEVEL PYMT =  22680
 2  LEVEL PYMT =  11776.153846154
 3  LEVEL PYMT =  8140.7037940700
 4  LEVEL PYMT =  6340.3368035340
 5  LEVEL PYMT =  5259.5255450035
 6  LEVEL PYMT =  4542.6031120000
 7  LEVEL PYMT =  4033.5204200066
 8  LEVEL PYMT =  3654.3000724283
 9  LEVEL PYMT =  3361.6730000110
 10  LEVEL PYMT =  3139.6120620386

t
15:41:43; TIME USED: CPU 00:00:37; TERM 00:57:00; PAGE 00:30:00.
```

Name: Reginald E. Wolfe Date of Degree: May 11, 19

Institution: Oklahoma State University Location: Stillwater, Oklaho

Title of Study: COMPUTERIZED CREDIT ANALYSIS

Pages in Study: 86 Candidate for Degree of Master Business Administration

Major Field: Business Administration

Purpose of Study: The purpose of this study is to develop a model (procedure) to assist a loan officer in the evaluation of commercial credit applications. The model is concerned with identification and analysis of the purpose and payment, inherent in any loa request. It functions in a real time conversational fashion to produce an extensive amount of information for decision-making purposes. The model is not a decision-model but generates data to aid a loan officer in his decisions and makes use of the conversational capabilities as well as the speed and power of the computer.

Findings and Conclusions: It was found that such a model could be developed. There are, however, certain limitations in the use of the model in its final form. The model is constrained in its application to analysis of commercial loan requests to finance growth in existing product lines (i.e. new ventures cannot be analyzed). The model does produce outputs to help evaluate the payment (repayment) capability of the firm, but the procedure does not concern itself with the need for collateral or protectio The model mainly produces a number of useful outputs which the loan officer can use to assist his judgment in deciding upon the size of a desired loan and its repayment schedule.

ADVISER'S APPROVAL Winfield P. Betty