DESIGN OF A COMPUTERIZED PROCEDURE
FOR COMMERCIAL LOAN ANALYSIS

By
DAVID L. LAMB
Bachelor of Science
Oklahoma State University
Stillwater, Oklahoma
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DESIGN OF A COMPUTERIZED PROCEDURE FOR COMMERCIAL LOAN ANALYSIS

Report Approved:

Winfield P. Betty

Report Advisor

Head, Department of Administrative Sciences
Purpose of Study: The purpose of this study is a discussion of existing techniques of commercial loan analysis and to develop a computer model to assist loan officers in the evaluation of credit decisions. The intent of the model is to present an orderly and compact arrangement of the financial data used to analyze loan requests. The model uses an IBM/CPS system. This system provides the model with real time conversational inputs and outputs, combined with the speed and power of computers.

Findings and Conclusions: It was found that there is not one correct method or technique for evaluation of loan requests, but a computer model can be developed that can provide assistance to the loan officer. The model produces financial outputs to help analyze the creditworthiness of a borrower. Although the model does produce outputs that help to evaluate the repayment capability of the firm, the model does not and should not concern itself with the actual credit decision. The procedures developed provides the loan officer with the flexibility that they need to make accurate credit decisions. By computerizing financial data needed in loan decisions, the loan officer is able to spend more time on those activities at which only men are adept.
PREFACE

This paper is concerned with the development of a computer model to assist banks in commercial loan analysis. Reasons for developing and using computerized bank models are presented along with a review of existing loan techniques and computer models.

I wish to express my appreciation to Dr. Winfield P. Betty for his assistance in the development of this paper.
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CHAPTER I

INTRODUCTION

Commercial loans are among banking's most important services to the business community. They are also among banking's major source of income. Yet, despite the unquestioned importance of the commercial loan function, it is one of the last banking activities to be automated. The reason for this lag appears to be the complexity of designing a comprehensive data processing system for commercial loans and insufficient understanding of the potential opportunities for improving the information available.

Where automated systems have been developed, designers have concentrated on the traditional loan accounting and servicing activities, rather than on systems to facilitate decision making. While banks have been slow to evolve such systems, the information needs of commercial loan officers and management have increased. The art of lending is rapidly becoming very complex. The analysis of a customer's financial statement, financing needs, repayment abilities and the monitoring of complex loan agreements are more difficult than ever. The continuing high demand for loans and the increasing cost of funds have also emphasized the need for greater analysis of customer loans.

In accordance with the views expressed above, banks are becoming increasingly concerned about the total relationship with their commercial
customers. The commercial loan officer is becoming more and more like an account representative, offering a wide range of financial services and acting as a financial consultant to his customers. But, due to the clerical accounting orientation of traditional systems, much of the information he needs to perform most effectively is not available. The construction of an automated information system is a possible answer to this problem.

While there are certain activities in commercial lending that cannot be automated, an analysis of the typical loan officer's activities will show that a disproportionate amount of his time is spent scanning, collecting, and correlating customer financial data. To a large extent, these processes can be automated to provide the loan officer and the commercial loan administrator with meaningful, readily-usable information. By computerizing this information, the loan officers will be able to spend less time on those clerical tasks that machines can do and more time on those activities at which men are particularly adept.

Purpose

The purpose of this study is to build a computerized commercial credit analysis model and information system for loan officers to use in analyzing loan requests. The model to be built is constructed in a flexible manner so that nonessential parts of the model are brought into analysis only when needed. An implicit assumption is made that the presentation of irrelevant information only complicates analysis; whereas, in more complex lending situations, all relevant data should be potentially available. Under such assumptions, the amount and types of information used are left to the discretion of the user of the programs.
Approach

The model that is developed is applicable to almost all types of companies. It uses common financial statements, ratio analysis and regression analysis of past trends in analyzing the credit-worthiness of loan customers. Furthermore, the information requested by the program and its output are presented in an orderly sequence to facilitate analysis.

Implementation of the model involves execution of a series of time-sharing computer programs. There are four main reasons for using the time-sharing approach:

1) Banks can avoid the need for expensive computer programs since such systems usually contain a library of programs.
2) Through time-sharing, operational efficiencies are attained.
3) The user has conversational ability with the computer.
4) On-line processing, therefore producing an in-depth credit analysis with a minimum of effect and time.

The programs are written in CPS ( Conversational Programming System) which is a sub-set of full PL-1. Communication with the computer is through typewriter-like terminals and acoustic couplers. This system gives the user the impression that the computer is responding to him alone because the terminals provide nearly instantaneous processing.

The CPS programs are converted to machine language by an interpretive compiler provided by IBM. The hardware used includes an IBM 2741 typewriter-like terminal connected to a IBM 360-65 computer through an IBM 2702 control unit. This particular combination of hardware and software gives the advantages that are desirable in a computer credit
analysis model such as economy of operation, response speed, and an accurate and orderly method of arranging financial data.

Organization of the Paper

Chapter One has dealt with purpose and approach. In this chapter the need for automation of credit analysis procedures was suggested. Also, the approach used in developing a related computer model was outlined. Chapter Two is concerned with a review of the literature related to how loan officers in commercial banks make their credit decisions. Also, in this chapter, some of the existing computerized credit models are presented showing their weaknesses and strengths. Chapter Three describes the design of the model, objectives of the model, what inputs are required, and the different types of financial statements and projections included in the output. The next chapter, Chapter Four, describes how to use the model and some of the major points to be analyzed in each statement to determine the soundness of credit customers. Finally, Chapter Five draws conclusions and summarizes the paper.
CHAPTER II

REVIEW OF EXISTING LOAN ANALYSIS TECHNIQUES

AND OTHER RELEVANT LITERATURE

Development of a systematic procedure for the analysis of credit requests is the purpose of this study. Most loans requested by firms are to finance expanded assets and seasonal needs in order to increase the sales of that firm. For these situations, a systematic procedure is needed because of the complexity of analyzing the borrower's creditworthiness and repayment ability.

In this chapter, financing problems are discussed from the point of view of the banker and various techniques of loan analysis are examined. After this, comes a discussion of existing computer models for loan analysis.

Credit Analysis – Banker's Point of View

Can old commercial loan analysis methods of the past provide adequate data for future analysis? This question was addressed by Dow Ostland (1) when he stated, "We are no longer witnessing temporary changes in the business climate which will disappear when other financing fads come along. Rather, we are seeing fundamental alterations in many of our methods of analyzing loan requests and doing business."
Ostland (1) further states, that there are three main areas of change:

1) lending for longer terms,
2) closer relationship with customer operations,
3) changes in the methods of loan administration.

What do these changes mean to bankers? Longer term loans will be paid back from future operations, not current profits; therefore, more emphasis should be placed on future cash flows and overall soundness of the business, rather than on current operations. Liquidity and current ratios will continue to be important in predicting short-run credit-worthiness and bankers will look closer at adequate capitalization.

Customers will expect bankers to fulfill their self-declared advisory role more completely than in the past. Seven or ten years is a very long time for any banking organization to risk its money. Alone with the customer’s needs for more advice, banks will certainly require a greater role in management because of loan length.

When loan customers come to borrow, they will expect little time to elapse before they receive an answer to their request. This implies that banks will need to develop more sophisticated and efficient loan review procedures.

The risk associated with debt financing is increasing rapidly according to Vandell (3). The environment of the world and the constraints that businesses must operate in are making the commercial loan analysis far more difficult. Many corporations are seeing their cash inflows becoming very unstable, causing many problems in the area of debt management and loan repayment.
As evidenced by the above discussion, the environment that bankers have worked in is changing rapidly, requiring them to develop new procedures and means of loan analysis.

What framework should banks use to evaluate loan requests? According to Houget (4), there are three topics to look at in term loan analysis:

1) analyzing the credit-worthiness of the borrower,
2) structuring the loan,
3) pricing the loan or evaluating the risk associated with a given loan.

He further states that the main component to be analyzed is a prediction of the cash flow in the future and the probability that such predictions are correct. Houget shows how the term "cash flow" has been abused and has become confused with working capital flows. Cash flow is not net profit plus depreciation, but also includes the changes in current assets and liabilities.

A method discussed by John Andealis (5) recommends the basic "Four C" approach of:

1) capacity of potential customers to service his debt,
2) the collateral at his disposal,
3) his overall credit rating,
4) and his character and reputation in the market place.

Another approach by Hunn (6), of people, purpose, payment, protection, and perspective, is referred to as the "Five P" approach. According to Hunn, once the data are gathered, this framework enables a conclusion to be reached rapidly in each category with people and payment normally carrying the most weight.
In an article by P. S. Cooper (7) in which he discusses the need of loan structuring, the importance of the Four Cs of credit is stressed but he implies that a Five P approach provides an inside look at the borrower and provides greater flexibility. Daniel Kujawa (8) in his article about how bankers approach business loans states:

"The traditional approach has been to consider and evaluate the Three Cs of credit, namely character, capacity and capital. Over the years, other Cs have been added, such as conditions (economic), collateral and competition (relative strength of the borrower in relation to his competitor). This approach has alliterative appeal, particularly in remembering the key factors. However, in my opinion, the alliteration tends to obliterate more direct and relevant considerations, and doesn't provide for a systematic and well organized approach."

That approach that Kujawa prefers is outlined and discussed by James A. Ensign (9) in an article entitled, "The Elements of Unsecured Business Loans". In this article, Ensign (10) delineates the four questions that must be answered in virtually every request for a business loan:

1) What is the quality (integrity and ability) of management?
2) What is the specific purpose of the loan?
3) What is the planned time and source of repayment?
4) What alternative sources of repayment, if any, are needed?

As evidenced by the above discussion, the approach by Ensign is very similar to the Hunn approach of evaluating loan requests. Hunn (11), Kujawa (12), Ensign (13), all believe that the Four or Five P approach to loan structuring is the most effective method. The approach of these authors has considerable appeal, and provides the basis for the approach recommended in this paper.
People

People are the borrowers of money, whether they be individuals, or representatives of partnerships or corporate entities. Hunn (14) implies that people should be appraised on two bases: are they responsible, successful businessmen and do they treat their bankers equitable? According to Kujawa (15), the quality of management is perhaps the single most important factor in the success or failure of any business. Kujawa further states that this factor is sometimes overlooked and frequently not given enough attention. The reason that this factor is frequently overlooked is that integrity and management ability, being intangible, are difficult to measure. Integrity, like ability, is a relative quality, and cannot be precisely measured, but can be gauged in an approximatic range. No one is totally honest when they come to a bank to borrow money, but fortunately most people fall somewhere in the favorable end of the scale.

There are many sources that can provide clues to a borrower's integrity. An investigation of the loan seeker's background through normal sources of suppliers, competitors and professional relationships will reveal whether they are responsible. Financial statements can also provide clues. For example, if a borrower requests $30,000 to pay income taxes and a review of the current financial statement shows a tax liability of only $18,000, obvious questions should be asked. Under such conditions it is possible that the borrower is not being honest with the loan officer and further questioning might reveal that the money is needed to pay other overdue liabilities. As another example, a small business owner might agree with the bank to curtail his annual bonus in order to build up
capital for growth. A later statement shows that the borrower has kept his promise partially. The balance sheet reveals that the borrower has acquired a new asset, a $5,000 car. He had cut his bonus, but has acquired a new car. From these examples, it would seem that a person's integrity can sometimes be approximated by reviewing what the borrower has borrowed money for in the past and whether or not he has used the money borrowed for the reasons stated.

The question of integrity and equitability by a borrower is demonstrated by his willingness as well as ability to repay past loans, in his reasonable attitude in sharing appropriate credit information, and in the general relationship between the bank and the loan customers.

Financial statements can also help to cast light on the ability of management. An evaluation of operating trends and returns on equity and total assets relative to their competitors are good indexes of success of management. This will not always be a good technique because of difficulty in adjusting statements for different accounting methods, so a closer examination of accounting methodology can sometimes be required.

The ability as well as honesty of borrowers is very important and should be scrutinized very closely for signs, whether they be positive or negative. Kujawa (17) states, "The debtors quality of management is the most important factor in lending." If management has been unsuccessful in the past, there is a good indication that this trend will continue in the future.

In summary, as the authors above indicate, the integrity and ability of borrowers is significant in determining credit-worthiness. The banker
must acquire all the salient information available about the loan request and evaluate the information diligently before making a credit decision.

Purpose

The intended use of a loan must be evaluated on the basis of the need and adequacy of the amount requested to serve that need. This might involve a judgment by the banker as to the overall economic benefits to be derived from expansion of operations, or from modernizing for improvement in efficiency. According to Hunn (18), from a balance sheet standpoint, the purpose of every bank loan can be assigned to one of three categories:

1) acquire assets,
2) replace other creditors,
3) replace or increase equity.

When assets are acquired, they are acquired for three purposes and these purposes must be identified:

1) For current assets of a seasonal nature, such as inventory fluctuations.
2) For current assets of a non-seasonal nature, such as the need for more work capital as a business grows.
3) For non-current assets, normally fixed assets used for increasing production capacity.

The banker is concerned with the wisdom of the proposed purpose of the loan and the effects of the loan on the financial conditions of the business. A loan to buy increased inventory in connection with a large manufacturing order is a normal purpose, but a loan to buy securities may be imprudent for both the bank and the borrower.
Many financial authors discuss the compatibility of the types of funds used in relation to the nature of assets financed. Johnson (19) used the term "suitability" and showed some of the problems encountered with unsuitable financing. Johnson, reiterates (20) the general rule of financing permanent assets with permanent funds, and sets as an objective for the financial managers, the financing of temporary current assets with flexible short term debt.

Many industrial firms have a long term rising sales trend coupled with cyclical and seasonal variations in sales. Under such conditions, total permanent assets rise steadily in the form of current assets and fixed assets. Weston and Brigham (21) stress these "financing patterns" in their discussion of working capital needs of a growing firm. They state that such increases in permanent assets are normally financed by long-term debt and equity. On the other hand, Weston and Brigham state that temporary increases in assets should be covered by short-term liabilities. They show that if these basic rules are disregarded, a profitable firm may become unable to meet cash obligations or suffer from periodic excesses of cash.

Full knowledge of the exact purpose of the loan proceeds will greatly assist in determining the correct answer to repayment. In many cases, businesses finance long-term asset expansion with short-term money. This causes many problems in the cash flow needs of a business. A banker must not only evaluate the purpose of the current loan request, but also the property of past financing.
Payment

The real test of a lending officer is his ability to establish a repayment schedule. The repayment schedule is usually derived from analysis of cash flows related to the purpose of the loan, so that the cash flows generated from the loan are sufficient to meet cash repayment without crippling the liquidity of the firm receiving the loan. Repayment of a loan should be based on cash generated from borrower's own resources in the ordinary course of business with no reliance for payment placed on sale of collateral or call upon endorsers.

In essence, the lending officer must analyze the sources and timing of repayment and be convinced that the probability of repayment is high. The difficulty in analyzing repayment is that the lender is dealing in the future, and is armed only with information from the past. The past, however, will usually suggest the probabilities of the future success of the company.

There are only four possible sources of repayment for any loan (22):

1) conversion of assets to cash,
2) cash resulting from profits earned and retained in the business (new capital internally generated),
3) cash resulting from additional investments by stockholders (new capital from external sources),
4) transfer of debt to another creditor.

Most loans made by banks are in the form of cash-flow loans. That is, repayment should be based on future profits or seasonal working capital turnover. The size of these cash flows can frequently be estimated from pro-forma statements.
In summary, identifying the revenue-generating capacity of the borrower's assets within a seasonal, industrial and economic context is the responsibility of the banker. Also, understanding the underlying determinants of the borrower's cash flow behavior is essential in establishing repayment ability.

Protection

Protection implies the taking of appropriate kinds of collateral, in negotiable form when possible, as a support for credit risks. There are two types of protection—internal and external. With internal protection the lender looks exclusively to the borrower. In the case of external protection, a third party adds its credit responsibility to that of the borrower. Internal protection implies the pledging of securities, inventories or other assets of the business requesting the loan. External protection, which is only a secondary thought in this discussion, usually takes the form of guarantees, endorsements or certain types of repurchase agreements.

Collateral or "protection" alone is rarely a sufficient basis for making a loan. Collateral is taken to offset some deficiencies in one or more areas of a firm. A good unsecured loan in most cases is many times better than a secured loan. According to Kujawa (23), the best protection a loan officer can have is to deal with an honest and competent businessman. Namely:

1) one who borrows for valid purposes,
2) one who clearly knows when and how he can repay the loan,
3) one who has alternative sources of repayment available,
4) and one whose business has a solid financial condition.
Perspective

Perspective is the last of the Five Ps, and one of the most important. The loan officer must review the four preceding Ps and determine if the risk and reward of a loan request fits into the total framework of the bank. The loan officer, along with analyzing the risk of principal loss, must also determine the possible opportunity loss of being "locked in" with a borrower. The bank must weigh the loan request against its current loan portfolio to make sure an appropriate balance is maintained between different types of loans. Only loans that are consistent with the bank's own loan policy should be accepted.

REVIEW OF EXISTING COMPUTER MODELS FOR LOAN ANALYSIS

The allocation of credit is thought by many to be the primary function of banks. All bankers must be concerned with various aspects of credit problems. How can the banker distinguish good credit risks from poor credit risks? What general procedures should the banker follow when dealing with prospective commercial loan customers? These general questions and means for identifying the answers to these questions have been built into computer programs with varying degrees of success for the last ten to fifteen years.

In this section of the paper an overview of relevant computer models used in commercial loan analysis, and loan selections techniques are discussed. The existing computer models can be divided into three general categories. These categories are:

1) linear programming model for loan selection,
2) credit scoring models,
3) computerized credit analysis models.

Type one and two are selection-type models, not involving personal analysis to the same extent as number three. The following discussion considers all three types of models showing weaknesses, strengths, and designs of models that have been developed in each category.

**Linear Programming Models**

Linear programming is a technique that maximizes or minimizes a linear objective function subject to a set of linear constraints. Problems solved with linear programming belong to a class of allocation problems that arise when a number of tasks have to be performed subject to a variety of constraints on resources.

The uses of L-P are aimed at the total loan portfolio rather than at individual analysis to determine credit-worthiness. L-P models were among the first models to be computerized by banks. Because portfolio selection is not the scope of this paper, a very general overview will be given concerning these types of models.

There are many different models developed in the last few years using L-P to evaluate loan selection. Although the models are somewhat different, they all rely on the same basis of allocating resources among competing uses. Because of this similarity between models, the discussion will center on a model developed by Robert Waterman and Robert Gee (24). Anyone wishing to learn more about the uses of L-P for bank models can be referred to Orgler (25), Eilon and Fowles (26), Morris (27), and Williams (28).

Commercial banks are confronted with several objectives. These
objectives are often in conflict with each other. For instance, bank management would like to maximize revenues, but realizes that safety and service to the community are also important. To complicate matters further, the bank must operate under a large number of legal and policy restrictions. As a result of these constraints, the problem of how best to invest a bank's funds is complex and subject to a great deal of judgment.

According to Waterman and Gee (29), "Linear programming is a systematic way of finding the best course of action when many variables and many conditions must be taken into consideration." Stated another way, it is an approach to satisfy an objective subject to many restrictions.

The objective of most banks is profit. The other objectives of the bank such as safety and community service can be viewed as part of the network of restrictions. The remaining restrictions are composed of general economic conditions, legal constraints, and bank policies.

The L-P models developed so far are used mainly in helping banks to allocate their loan portfolio among different types of loan categories (unsecured loans, secured loans, real estate loans, etc.).

Since L-P models are not aimed at individual loan requests, but, are general in nature dealing with the problems of allocation of funds, a further discussion of these types of models is not within the intended scope of this paper. It is worth noting, however, that L-P has contributed heavily in developing systematic models giving banks insight into their everyday operations and in evaluating these operations.
Numerical credit scoring is a concept that has been well-known for years to those responsible for making installment loans to retail customers. Under this system, points are assigned depending on the answers given to each item in the loan application. The total points for an application are then compared to some critical level, and the loan is made or rejected according to the criterion of whether the score of the application is above or below some preassigned "cut off" point. Whether or not numerical credit scoring is worthwhile depends on the relevance of the criteria, the reliability of the data, and the weights given to the various factors.

An article by Myers and Forgy (30) describes the results of a study in which statistical techniques were employed to determine the relative weights which should be assigned to various questions on an application form. By assigning different weights through computer analysis of different questions, the validity of retail credit scoring was increased substantially.

For several reasons, it is difficult to apply the credit scoring method to the evaluation of commercial loans. Hamner and Orgler (31) discuss these problems. According to these writers, the number of commercial borrowers is normally quite small compared to customers for consumer credit, thus, there is a problem in obtaining a sufficient number of observations for a statistically significant study. Second, there are substantial variations among commercial loans with respect to their size, terms, collateral, and payment procedures, all of which are relatively uniform in the case of consumer loans. Finally, there is a lack of reliable up-to-date financial data on commercial borrowers, particularly small
business borrowers.

Because of problems similar to those just mentioned, it is very difficult to develop a general credit scoring model for commercial loan applications. There are however, several interesting models that have been developed recently which appear to be of some value. The discussion below is mainly based on a model now installed at the Indiana National Bank (32). There are many other models. For example, Ewert (33) developed a model for screening trade credit applications by small firms. The model combines information on the owner with data from Dunn and Bradstreet reports. Other studies involving the derivation of credit-scoring models for business loans were developed by Edmister (34) (35) and Abate (36). Another interesting model was developed by Cohen, Gilmore, and Singer (37), that simulates the commercial lending decisions of bank loan officers. In fact, during the past thirty years, credit scoring models have been developed and implemented in a variety of credit granting institutions with mixed results. According to Heffehouse and Wentworth (38), most models appear to fail because of a general lack of creditability or because of their use as a "black box" that ignores human judgment. They believe, however, that credit scoring can be installed successfully.

The Credit Analysis Model (CAM) currently being implemented at Indiana National Bank, utilizes a two-stage decision process. In stage one the banker is able to assign points to the application in accordance with statistically determined weights. Some applications are accepted or rejected automatically, depending on the risk (high or low scores) associated with the loan. Those requiring additional consideration are forwarded to an experienced credit analyst. The analyst then supplies
his judgment in reaching a conclusion. If after the two-stage process, the analyst is unable to reach a conclusion, he may request additional information in the form of credit reports. Loans can be accepted or rejected at three different times during the evaluation process:

1) after a statistical score is applied,
2) after consideration of the secondary variables,
3) after examination of credit reports.

As with any computer model, the value of the model is dependent on the quality and quantity of the input data. In the case of credit scoring models, there are many ways in which the validity or the consistency of the model can be undermined. Most of the problems with credit scoring models were discussed at the start, but the main problem is the inability to define the proper weights to assign each category. The validity of these weights can only be measured from reviewing the loans made using this technique.

The Indiana Bank, understanding the strengths and weaknesses of credit scoring, has developed a computer model which scores loans and then passes the evaluation on to a loan analyst who is able to justify accepting or rejecting the loan. By using personal judgment and the computer's ability to analyze large amounts of data, the loan officer is able to make better credit decisions.

Computerized Credit Analysis Models

These types of models use the computer to make calculations, project trends, and perform repetitious ratio analysis. The actual credit decision is left to the discretion of the analyst. The computer is used
only as a means to facilitate the formulation and presentation of data.

The model discussed by Sangster and Raguso (39) uses a timesharing program which does not have real-time response capability. The model is also limited in the amount of information outputs. They have found that the following reports on a six period basis can be produced for a cost of approximately $25.00 including analyst time:

1) balance sheet and income statements,
2) common size statements,
3) sources and uses of working capital,
4) ratio analysis.

All the above reports involve an automatic currency conversion to U.S. dollars. They estimate that the same reports would take up to eight hours of analyst time to do by hand.

Burd and Blades (40) claim that computers can become a valuable partner of the bank lending officer by providing quick, comprehensive evaluations of borrowers. Burd and Blades have developed a very complete model providing the banker with:

1) balance sheet,
2) income statement,
3) income statement (percent of total sales),
4) ratio analyst,
5) sources and uses statement,
6) schedule showing the interest expense and principal repayment.

Although these statements are comprehensive, the analysis is done by a separate department other than the commercial loan department and requires 24 hours for turn-around.
These authors believe that such models provide flexibility that is needed over manual procedures. Also, it is believed that these models increase the analyst's capabilities due to the number of quantitative factors which can be introduced into credit decisions.

In summary, the literature review has suggested the availability of a mixed variety of information on how to analyze the commercial loan requests. Although there are many articles that relate to bank loan analysis, there is still ample space in the literature for further studies. The areas of financial theories relating to banking institutions appears to lag the theories and models relating to other areas of finance.

In developing the model for this study, many of the concepts and techniques presented in the above review were utilized. The resulting model is intended to systematically incorporate a number of these techniques into a comprehensive analytical loan review procedure.
CHAPTER III

DESIGN OF THE MODEL

The orderly presentation of financial data in making credit decisions is the overall object of this model. The computer outputs provide information showing past performance figures and projections of future cash flows—hopefully projecting a reliable picture of the ability of the borrower to repay principle and interest. In order to produce this information, the model receives a large number of purposeful inputs. The inputs consist of both historical and projected financial data. Once this data is entered, it is manipulated and transformed to meet the specific needs of the user. The computer model is composed of thirteen logic modules which are called into the model when needed. The input data is limited in that only basic or aggregate accounts are built into the programs and the borrower's financial data must be redefined to fit the accounts. The accounts that are created are general in nature to insure that all the necessary balance sheet and income statement data can be entered. The output of the model is constrained somewhat, because of the use of generalized inputs. Generalization of the inputs and outputs are essential in order to utilize the Conversational Programming System (CPS). These accounts are defined in a way so that their aggregate form will have little effect on the validity of the model.
Inputs to the Model

The computer model requires a large number of inputs consisting of:

1) annual balance sheet up to five years,
2) annual income statement up to five years,
3) monthly projected sales for the coming year,
4) monthly projected operating expenses for the coming year,
5) proposed loan amounts and terms, and
6) certain miscellaneous data consisting mainly of yes and no responses.

If organized, this information requires a maximum of fifteen minutes to enter. Once the data is entered, it is stored on temporary disk files for use by the different logic modules.

Components of the Model

The control module calls the appropriate modules in a logical sequence following the instructions of the user. Because of certain technical problems with the O.S.U. computer system, four of the programs must be loaded by the user. These logic modules, after being loaded by the user, perform in the same manner as the other modules. After each function is completed, the control model is in command except for the four modules which must be loaded by the user. A flow chart of each logic module and it's basic function is shown in Figure 1.
Dave
Control Program
Calls External
Programs

Dave 1
Enters Historical
Data

2A & Dave 2B
Prints
Income Sheet
&
Profit Statement

Dave 2C & Dave 2D
Calculates &
Prints Sales
Relationship
Statements

Prints
Total Asset
Relationship
Balance Sheet

Dave 3
Calculates &
Prints
Ratios

Dave 4
Calculates &
Prints
Sources & Uses
of Funds

Dave 85
Calculates & Prints
Proforma Balance
Sheet using Sales
Relationship

Dave 87
Calculates & Prints
Proforma Balance
Sheet using Total
Asset Relationship

Dave 91
Calculates & Prints
Net Income & Cash Flow
Statements after
New Financing

Dave 93
Enter Monthly Budget
Figures
Calculates & Prints
Seasonal Needs
Dave

This program contains very little programming logic, but primarily is a series of call statements. Each call statement causes a specific external procedure or logic module to be loaded and executed by the CPU.

Dave is the program that the user loads and executes in CPS. At any point in time, Dave and one of the external procedures are resident in the 360-65 CPS memory. Dave takes one "page" and each logic module is two, three, or four "pages" in size. In the O.S.U. CPS system, only four pages of programs can be in CPU memory by a single terminal user.

This restriction imposed by the O.S.U. computer system causes some inconvenience to the user but, does not substantially effect the model. There are four programs, (Dave 85, Dave 87, Dave 91, and Dave 93), that must be loaded and executed by the user. The control module gives ample instruction for the steps that the user must perform. The files that are created in earlier modules are accessible for use in the four programs.

Dave 1

Dave 1 is the first logic module. This external procedure asks the user to enter the historical balance sheet and income statements for up to five years. A number of elementary balance sheet and income statement calculations that were derived from this data is retained for other logic modules by writing a temporary disk file.

Dave 2A and Dave 2B

Dave 2A uses the temporary files to print comparative balance sheets
for each year of history. Dave 2B prints the comparative income statements and cash flow figures for the historical data entered. The intent here is to provide the user with a compact and orderly record of the historical financial data which the user has furnished the model.

**Dave 2C and Dave 2D**

Dave 2C and Dave 2D use the temporary files to evaluate and print comparative balance sheets and income statements showing the relationship between individual accounts and sales. The statement is printed in percentages helping the user to better analyze historical trends of the firm being evaluated.

**Dave 25**

This program uses the temporary files to provide a comparative balance sheet showing the relationship between individual assets and total assets and between individual liabilities and total net worth and liabilities. The intent, as in the earlier modules, is to provide the user with an orderly picture of historical data and to help the user to determine balance sheet trends.

**Dave 3**

This module calculates and prints sixteen financial ratios from historical data stored on the temporary files. These ratios are listed below.

**Liquidity Ratios**

1. Current - Ratio
2. Quick Ratio
3. Inventory to Working Capital

Leverage Ratios
4. Debt to Assets
5. Interest expense to earnings before interest expenses and taxes

Activity Ratios
6. Accounts receivable to daily sales
7. Current liabilities to net worth
8. Fixed asset turnover
9. Fixed asset net worth
10. Total asset turnover
11. Cash velocity
12. Inventory turnover

Profitability Ratios
13. Profit margins
14. Operating expenses to sales
15. Return on assets
16. Net worth return

Historical data is accessed from the temporary disk file in Dave 4. This data is used to calculate sources and uses of funds statements, and to show balance sheet changes from one year to the next. Dave 4, besides showing the individual account changes, also shows the total changes in sources and uses of funds.

This module is able to use the historical data to perform regression
analysis on the past sales to form a trend. If the trend of past sales is not adequate, the user may enter his own projected sales figures. By assuming a constant relationship between sales and individual accounts, the computer is able to project the balance sheets for the next five years.

Dave 87

Again, regression analysis is used on historical data to form a trend. This time a projected balance sheet is created by using the trend of total assets and liabilities plus total net worth. If the regression figure is not feasible the user may enter his own projection for these accounts. A constant relationship is assumed between total assets and individual assets accounts with liabilities, plus net worth and individual liabilities accounts also assuming a similar relationship.

Dave 91

This logical module reads the temporary disk files to get the historical data to project future income and cash flow. This program, as the two preceding programs, uses regression analysis to project trends in future sales. If these projections are not accurate, the user may enter his own sales projections for the next five years. Dave 91 assumes a constant relation between sales and expenses in calculating and printing the pro-forma income statements. The user is required to enter the amount and terms of the loan request and the program shows the cash flow of the firm after payment of existing debt and the new debt payment.
More input to the model is requested by this module. Specifically, the user must provide monthly cash budgets figures, including monthly sales, operating expenses, and a category to include all other monthly expenses. Beginning cash and minimum cash totals must also be entered. The calculation that follows is a simple cash budget calculation on a monthly basis to show the seasonal needs and the size of credit that is needed to meet these seasonal needs. This information is presented in tabular form.

Outputs of the Model

The outputs are of two types and can be classified as historical or pro-forma. The outputs and inputs are intermingled throughout the model in a conversational manner so that flexibility can be provided to the user.

The historical outputs are provided initially and the pro-forma outputs are based on this earlier financial data. Beginning with historical financial statements, the terminal types out annual comparative balance sheets and income statements for up to five years. Next, the model provides the user with comparative balance sheets and income statements showing relationships between sales and individual accounts and between total assets and liabilities plus total net worths. Financial ratios are next calculated and printed from the historical data into a tabular form. Then, the program prints source and uses statements to show application of funds from one year to the next.

After this historical data is presented to the banker in an orderly
fashion, the banker is able to determine the past operating trends of the business. Beginning with pro-forma balance sheets there is a transition between historical and projected data. The next two outputs of the model present five years of pro-forma balance sheets using two different means to project the account totals. The next module provides the user with five years of pro-forma income statements, assuming a sales relationship. The output shows the amount of cash that will be available to meet dividends and future expansion after the new debt payments are paid.

Finally, the computer provides the user with a monthly cash budget showing the surplus or the amount of funds that need to be borrowed to meet seasonal needs.

**Summary**

The model discussed in the preceding paragraphs involves execution of a series of programs in a conversational mode. The historical inputs are entered first and subsequent printed outputs are arranged in a systematic manner for easy interpretation by the banker. The next chapter describes a sample execution and some of the main factors in the output useful in analyzing a loan request.
CHAPTER IV
SAMPLE EXECUTION OF THE MODEL

The model presented is not intended to replace the loan officer, but to assist in credit decisions. By using this model, the loan officer gains the speed and power of the computer to quickly perform a great many calculations. The results of these calculations are presented in an orderly fashion giving the loan officer information upon which to judge customer credit-worthiness.

This chapter is concerned with showing the user how to use the IBM/CPS system, and how the model can be executed. A credit decision case is presented and the model is executed showing the ability of the computer to help the loan officer make credit decisions. There is a brief discussion of the output of the model, pointing out some of the areas to be analyzed in making credit decisions.

Use of IBM/CPS

Implementation of the model requires access to the proper combination of computer hardware and software. If not otherwise available, such facilities can be leased for a reasonable cost from a computer service organization.

The procedure for using the O.S.U. IBM/CPS is as follows:
1) Turn the IBM 2741 on.
2) Press the "talk clear" button on telephone.
3) Dial the extension telephone number of the computer (7641).
4) When you hear a high screeching tone, indicating the computer has answered, press "Data" button on the telephone.
5) Hit the "Return" key on the terminal.
6) "Login" on the terminal.
7) Give the "Password".

After the user has logged in, they are ready to execute the model. By typing the command "load (Dave)" the user loads the control module. Dave is executed by typing in the command "Xeq". At this command, the control module (Dave) calls the first external procedure and from this point on (except for the technical problems discussed earlier), the procedure is directed by Dave according to the responses of the user.

Case

Limber Lumber Company

The Limber Lumber Company is a wholesaler of hardwood lumber. The lumber company has had steady growth of sales over the past five years, and they predict that sales will continue to increase at about the same rate as in the past. In order to take advantage of the strong market for lumber, Limber Lumber has requested a $100,000 term loan for expansion of facilities and increases in working capital. The loan is to be amortized over a five-year period at a interest rate of thirteen percent.

Sample Execution

The analysis of financial statements consists of a study of relationships and trends to determine whether or not the financial position and results of operations of the company are satisfactory or unsatisfactory.
The analytical methods and techniques that are shown in the financial outputs below, are used to measure the relationships among the financial statement items of a single set of statements and the changes that have taken place in these items as reflected by successive financial statements. The objective of any analytical method or model is to simplify the data under review to more understandable terms.

The personal aspects of the case are not discussed, the intent of the case is to present the financial data so that a sample execution of the model can be shown. In the next few pages the actual print-out that the banker would receive on Limber Lumber Company is presented.

After performing "login" to CPS and after loading the program, execution can begin. By typing in "xeg" program, execution can be initiated.

The first instruction given by the model tells the user to enter the number of years of historical financial statements that he wishes to analyze. After entering the number of years, the program requests balance sheet data and income statement data for each year. Sample execution of the first part of the program is shown below.
This is a program to be used in a Credit Analysis of any business loan request.

The user will be asked to enter information into the computer.

This information will be requested in the form of summary accounts. Listed below is a list of the accounts used by the program. Please arrange your financial data to fit into these accounts:

ACCOUNT GROUPINGS ABBREVIATIONS USED

- CASH ------------------- CASH
- ACCOUNT RECEIVABLES --- A/R
- INVENTORIES ----------- INV
- OTHER CURRENT ASSETS -- OCASET
- NET FIXED ASSETS ------ FASET
- ACCOUNT PAYABLE ------- A/P
- OTHER CURRENT LIABILITY --- OCLIAB
- LONG-TERM LIABILITY ------ LTLIAB
- COMMON STOCK --------- CSTK
- PREFERRED STOCK ------ PFD
- RETAINED EARNINGS ------ RETAIN
- SALES ------------------ SALES
- COST OF GOODS SOLD ---- CGS
- TOTAL OPERATING EXPENSE --- TOX
- INTEREST EXPENSE ------ INTEXP
- TAXES ------------------ TAXES

Please enter this information as it is asked for by the computer.

The user will be asked yes and no questions, please answer in capital letters.

Enter the number of past years of financial data to be analyzed. (max 5 yrs).

Yrs

?5

Enter the Balance Sheet Data for years 1

cash(1) 31000
inv(1) 542000
ar(1) 136000
ocaset(1) 23000
fasset(1) 337000
ar(2) 107000
ocaset(2) 107000

lateral(1) 10

ltliab(1) 0

ccstk(1) 216000
pfed(1) 0

retain(1) 691000
Now enter the Income Statement Data for year 1

sales(1)
71542000
css(1)
71103000
tox(1)
7391000
inexp(1)
716000
taxes(1)
710000

Enter the Balance Sheet Data for years 2

cash(2)
724000
inv(2)
7641000
ar(2)
7114000
ocase(2)
720000
fasset(2)
7316000
ap(2)
771000
ocliab(2)
720000
ltlib(2)
7106000
cstk(2)
7216000
pfd(2)
70
retain(2)
7702000

Now enter the Income Statement Data for year 2

sales(2)
71600000
css(2)
71193000
tox(2)
7418000
inexp(2)
79000
taxes(2)
70

Enter the Balance Sheet Data for years 3

cash(3)
719000
inv(3)
7646000
ar(3)
7170000
ocase(3)
710000
fasset(3)
7292000
ap(3)
771000
ocliab(3)
721000
ltlib(3)
7146000
cstk(3)
7216000
pfd(3)
70
retain(3)
7683000
### Income Statement Data for Year 3

- **Sales (3)**: $1,400,000
- **Costs (3)**: $998,000
- **Tax (3)**: $37,500
- **Interest (3)**: $375,000
- **Taxes (3)**: $120,000
- **Total**: $0

### Balance Sheet Data for Year 4

- **Cash (4)**: $106,000
- **Inventory (4)**: $555,000
- **Accounts Receivable (4)**: $152,000
- **Accounts Payable (4)**: $10,000
- **Equipment (4)**: $329,000
- **Accounts Payable**: $82,000
- **Notes Payable**: $24,000
- **Long-Term Debt**: $1,132,000
- **Common Stock**: $121,600
- **Retained Earnings (4)**: $674,000

### Income Statement Data for Year 4

- **Sales (4)**: $1,800,000
- **Costs (4)**: $1,250,000
- **Tax (4)**: $40,000
- **Interest (4)**: $132,000
- **Taxes (4)**: $130,000
- **Total**: $0

### Balance Sheet Data for Year 5

- **Cash (5)**: $400,000
- **Inventory (5)**: $557,000
- **Accounts Receivable (5)**: $250,000
- **Accounts Payable (5)**: $150,000
- **Equipment (5)**: $350,000
- **Accounts Payable**: $35,000
- **Notes Payable**: $172,000
- **Long-Term Debt**: $15,000
- **Common Stock**: $146,000
- **Retained Earnings (5)**: $1,637,000
- **Total**: $0

### Balance Sheet Data for Year 5 (Continued)

- **Cash**: $637,000

Now enter the Income Statement Data for year 5

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<tr>
<th>Description</th>
<th>Value</th>
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<tr>
<td>cogs(5)</td>
<td>71400000</td>
</tr>
<tr>
<td>taxes(5)</td>
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<tr>
<td>intexp(5)</td>
<td>714000</td>
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<tr>
<td>sales(5)</td>
<td>741000</td>
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The first output that the loan officer receives is the historical balance sheet, income and cash flow statements. The statements provide the loan officer with the means of checking his inputs of historical data. The compact arrangement of these statements provide the loan officer with five years of historical data on less than one page. The loan officer can quickly evaluate these statements to determine changes in individual accounts from one year to the next.

To determine the cash flow you must enter the amount of depreciation taken in the preceding year:

<table>
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<th>Amount</th>
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<tr>
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<td>2</td>
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<tr>
<td>3</td>
<td>728000</td>
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<td>4</td>
<td>726000</td>
</tr>
<tr>
<td>5</td>
<td>729000</td>
</tr>
</tbody>
</table>
he computer will now print-out the information just read into the computer showing Balance Sheet, Income Statements and Cash Flow Statements.

<table>
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<tr>
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<th>3</th>
<th>4</th>
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<tr>
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<td>10000.00</td>
<td>15000.00</td>
</tr>
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<td>14000.00</td>
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The next three statements, consisting of comparative balance sheets and income statements using percentage relationships, provide the user with an indepth analysis of historical financial trends. The first statement printed by the computer is a historical balance sheet showing the relationship between individual accounts and sales in that year. The last statement in this section consists of a percentage balance sheet which shows the relationship between total assets and other asset accounts and total net worth plus liabilities in relation to liabilities, common stock and retain earnings.

---

Do you wish for the computer to print-out the Percentage Balance Sheet and Income Statements as a Percentage of Sales?

YEES

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<tr>
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<td>.084</td>
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<td>.086</td>
<td>.059</td>
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</tbody>
</table>

| SALES   | 1.000 | 1.000 | 1.000 | 1.000 | 1.000 | 1.000 |
| CGS     | .715  | .746  | .713  | .694  | .700  | .714  |
| MARGIN  | .285  | .254  | .287  | .306  | .300  | .286  |
| OP EXP  | .254  | .261  | .288  | .222  | .215  | .244  |
| EBIT    | .331  | -.007 | .019  | .083  | .085  | .042  |
| INT EXP | .010  | .006  | .009  | .007  | .007  | .008  |
| EBT     | .207  | -.012 | .011  | .076  | .078  | .035  |
| TAXES   | .006  | 0.    | 0.    | .008  | .020  | .007  |
| NI      | .014  | -.012 | .011  | .068  | .057  | .028  |
Do you wish to see a print-out of the comparative Balance Sheet comparing the accounts to Total Assets and Total Net Worth+Liabilities?

<table>
<thead>
<tr>
<th>Periods=</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>AVE</th>
</tr>
</thead>
<tbody>
<tr>
<td>CASH</td>
<td>.029</td>
<td>.022</td>
<td>.017</td>
<td>.094</td>
<td>.028</td>
<td>.038</td>
</tr>
<tr>
<td>INVENT</td>
<td>.507</td>
<td>.575</td>
<td>.568</td>
<td>.471</td>
<td>.462</td>
<td>.517</td>
</tr>
<tr>
<td>A/R</td>
<td>.127</td>
<td>.102</td>
<td>.150</td>
<td>.135</td>
<td>.207</td>
<td>.144</td>
</tr>
<tr>
<td>OCASSET</td>
<td>.022</td>
<td>.018</td>
<td>.009</td>
<td>.009</td>
<td>.012</td>
<td>.014</td>
</tr>
<tr>
<td>TOTCA</td>
<td>.685</td>
<td>.717</td>
<td>.743</td>
<td>.708</td>
<td>.710</td>
<td>.713</td>
</tr>
<tr>
<td>FASSET</td>
<td>.315</td>
<td>.283</td>
<td>.237</td>
<td>.292</td>
<td>.290</td>
<td>.287</td>
</tr>
<tr>
<td>TOTASS</td>
<td>1,000</td>
<td>1,000</td>
<td>1,000</td>
<td>1,000</td>
<td>1,000</td>
<td>1,000</td>
</tr>
</tbody>
</table>

A ratio analysis comes next. The computer prints sixteen ratios for each year of historical data. These ratios give the user the means for a quick analysis of the profitability, activity, debt leverage and liquidity of the firm. By comparing these ratios to industry standards, the loan officer is able to determine the relative financial and operating strengths of the firm being analyzed.

Do you wish to see a printout of the ratio analysis.

<table>
<thead>
<tr>
<th>Periods=</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
</tr>
</thead>
<tbody>
<tr>
<td>LIQUIDITY RATIO</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Int-Ratio</td>
<td>4.519</td>
<td>8.780</td>
<td>9.185</td>
<td>7.538</td>
<td>4.135</td>
</tr>
<tr>
<td>L-Ratio</td>
<td>1.173</td>
<td>1.736</td>
<td>2.163</td>
<td>2.528</td>
<td>1.444</td>
</tr>
<tr>
<td>W.C. to W.C.</td>
<td>.951</td>
<td>.905</td>
<td>.858</td>
<td>.766</td>
<td>.858</td>
</tr>
</tbody>
</table>

| LEVERAGE RATIO |
| to Assets | .152 | .177 | .209 | .211 | .293 |
| to EBIT | 3.000 | -1.222 | 2.250 | 11.538 | 12.143 |

| ACTIVITY RATIO |
| Sales | 32.192 | 26.006 | 44.321 | 30.822 | 45.625 |
| Net Worth | .179 | .099 | .102 | .119 | .243 |
| Turnover | .576 | .344 | .325 | .370 | .410 |
| Turnover | 4.4 | 4.4 | 5.4 | 5.4 | 5.4 |
| Velocity | 49.743 | 49.743 | 49.743 | 49.743 | 49.743 |
| turnover | 73.684 | 73.684 | 73.684 | 73.684 | 73.684 |

| PROFITABILITY RATIOS |
| Margin | .014 | -.012 | .011 | .068 | .057 |
| Expense/Sales | .254 | .261 | .286 | .222 | .215 |
| on Assets | .021 | -.018 | .013 | .108 | .095 |
The computer next provides the loan officer with a report of balance sheet changes between each period of historical data. From this the loan officer is able to determine if funds have been appropriately applied in the past.

<table>
<thead>
<tr>
<th>YEAR 1 to 2</th>
<th>SOURCES</th>
<th>USES</th>
</tr>
</thead>
<tbody>
<tr>
<td>CASH</td>
<td>7000.00</td>
<td></td>
</tr>
<tr>
<td>INVENT</td>
<td>22000.00</td>
<td>99000.00</td>
</tr>
<tr>
<td>A/R</td>
<td>3000.00</td>
<td></td>
</tr>
<tr>
<td>OCASSET</td>
<td>21000.00</td>
<td></td>
</tr>
<tr>
<td>FASSET</td>
<td></td>
<td></td>
</tr>
<tr>
<td>OCLIAB</td>
<td>106000.00</td>
<td>36000.00</td>
</tr>
<tr>
<td>LTLIAB</td>
<td></td>
<td>35000.00</td>
</tr>
<tr>
<td>CSTK</td>
<td></td>
<td></td>
</tr>
<tr>
<td>PFD</td>
<td>11000.00</td>
<td></td>
</tr>
<tr>
<td>TOTAL</td>
<td>170000.00</td>
<td>170000.00</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>YEAR 2 to 3</th>
<th>SOURCES</th>
<th>USES</th>
</tr>
</thead>
<tbody>
<tr>
<td>CASH</td>
<td>5000.00</td>
<td>5000.00</td>
</tr>
<tr>
<td>INVENT</td>
<td></td>
<td>56000.00</td>
</tr>
<tr>
<td>A/R</td>
<td>10000.00</td>
<td></td>
</tr>
<tr>
<td>OCASSET</td>
<td>24000.00</td>
<td></td>
</tr>
<tr>
<td>FASSET</td>
<td></td>
<td></td>
</tr>
<tr>
<td>OCLIAB</td>
<td>1000.00</td>
<td></td>
</tr>
<tr>
<td>LTLIAB</td>
<td>40000.00</td>
<td></td>
</tr>
<tr>
<td>CSTK</td>
<td></td>
<td></td>
</tr>
<tr>
<td>PFD</td>
<td></td>
<td>19000.00</td>
</tr>
<tr>
<td>RETAIN</td>
<td></td>
<td></td>
</tr>
<tr>
<td>TOTAL</td>
<td>80000.00</td>
<td>80000.00</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>YEAR 3 to 4</th>
<th>SOURCES</th>
<th>USES</th>
</tr>
</thead>
<tbody>
<tr>
<td>CASH</td>
<td>115000.00</td>
<td>87000.00</td>
</tr>
<tr>
<td>INVENT</td>
<td>18000.00</td>
<td></td>
</tr>
<tr>
<td>A/R</td>
<td>11000.00</td>
<td>37000.00</td>
</tr>
<tr>
<td>OCASSET</td>
<td>3000.00</td>
<td></td>
</tr>
<tr>
<td>FASSET</td>
<td></td>
<td></td>
</tr>
<tr>
<td>OCLIAB</td>
<td>21000.00</td>
<td>14000.00</td>
</tr>
<tr>
<td>LTLIAB</td>
<td></td>
<td></td>
</tr>
<tr>
<td>CSTK</td>
<td></td>
<td></td>
</tr>
<tr>
<td>PFD</td>
<td>9000.00</td>
<td></td>
</tr>
<tr>
<td>RETAIN</td>
<td></td>
<td></td>
</tr>
<tr>
<td>TOTAL</td>
<td>147000.00</td>
<td>147000.00</td>
</tr>
</tbody>
</table>
The initial outputs are historical in nature. The next three procedures use this historical data to produce two different types of projected balance sheets and a pro-forma income statement. Pro-forma statements are a means to potentially judge future credit-worthiness of the borrower. Financial data predicting future results and trends should not be considered as true predictor of the future, but should serve only as a guide. These pro-forma statements may assume relationships which are not true, e.g., continued growth of common stock at the same rate as in the past. The loan officer should be able to recognize rough areas and make the proper adjustments. The main purpose of pro-forma statements is to provide a starting point for predicting the borrower's ability to repay loan commitments.

The first pro-forma statement presented in this model is a projected balance sheet for the next five years. The means used to calculate this statement is a projection of future sales either by using the borrower's estimate of future sales, or the computer projections using regression analysis of past sales trends. Once the future sales are determined, the individual accounts are calculated by assuming a constant relationship between the average historical sales and balance sheet totals.
The programs listed below are part of the analysis but because of technical constraints on the OSU computer system you must load and execute these programs yourself. Follow the instructions have no problems.

Types of Additional Programs

<table>
<thead>
<tr>
<th>Program</th>
<th>Key needed in Loading</th>
</tr>
</thead>
<tbody>
<tr>
<td>Proforma Balance Sheets (Sales Relationship)</td>
<td>Dave85</td>
</tr>
<tr>
<td>Proforma Balance Sheets (Asset and Worth)</td>
<td>Dave87</td>
</tr>
<tr>
<td>Proforma Income Statements</td>
<td>Dave93</td>
</tr>
<tr>
<td>Monthly Cash Budget</td>
<td></td>
</tr>
</tbody>
</table>

The programs that you desire to execute load in the following manner.

Type in this statement: load(Dave93)
Wait for the computer to answer then type in xe0

For each additional program you wish to use just type in the key for loading and xe0 to start it.

load(Dave85, lb)
** KEY INCORRECT.
?load(Dave85)
?xe0

Are the Sales Projections printed below from a regression of your past sales a accurate forecast of future sales. If they are not the computer will ask for your own projections.

<table>
<thead>
<tr>
<th>Sales (SalPro)</th>
<th>2003200.00</th>
<th>2114800.00</th>
<th>2226400.00</th>
<th>2338000.00</th>
<th>2449600.00</th>
</tr>
</thead>
<tbody>
<tr>
<td>?YES</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Balance Sheet Projections based on Sales relationship for Years

<table>
<thead>
<tr>
<th>CASH</th>
<th>49905.35</th>
<th>52685.62</th>
<th>55445.89</th>
<th>58246.16</th>
<th>61026.43</th>
</tr>
</thead>
<tbody>
<tr>
<td>INVENY</td>
<td>715961.77</td>
<td>755848.61</td>
<td>795735.46</td>
<td>835622.31</td>
<td>875509.16</td>
</tr>
<tr>
<td>A/R</td>
<td>196441.87</td>
<td>207385.82</td>
<td>218329.76</td>
<td>229273.71</td>
<td>240217.65</td>
</tr>
<tr>
<td>OCASSET</td>
<td>19076.12</td>
<td>20139.86</td>
<td>21201.61</td>
<td>22264.36</td>
<td>23327.10</td>
</tr>
<tr>
<td>TOTCA</td>
<td>981385.10</td>
<td>1036058.91</td>
<td>1090732.72</td>
<td>1145406.54</td>
<td>1200080.35</td>
</tr>
<tr>
<td>FASSET</td>
<td>393587.35</td>
<td>415514.44</td>
<td>437441.53</td>
<td>459368.63</td>
<td>481295.72</td>
</tr>
<tr>
<td>TOTASS</td>
<td>1374972.46</td>
<td>1451573.36</td>
<td>1528174.26</td>
<td>1604775.16</td>
<td>1681376.06</td>
</tr>
<tr>
<td>A/P</td>
<td>118603.56</td>
<td>125211.07</td>
<td>131818.57</td>
<td>138426.08</td>
<td>145033.59</td>
</tr>
<tr>
<td>OCLIAB</td>
<td>37660.68</td>
<td>39758.79</td>
<td>41856.90</td>
<td>43955.01</td>
<td>46053.12</td>
</tr>
<tr>
<td>TOTCT</td>
<td>156264.24</td>
<td>164969.86</td>
<td>173675.47</td>
<td>182381.09</td>
<td>191086.70</td>
</tr>
<tr>
<td>LTLLAB</td>
<td>126950.42</td>
<td>134022.93</td>
<td>141095.45</td>
<td>148167.97</td>
<td>155240.48</td>
</tr>
<tr>
<td>CSTK</td>
<td>263366.13</td>
<td>278038.48</td>
<td>292710.83</td>
<td>307363.19</td>
<td>322055.54</td>
</tr>
<tr>
<td>PFD</td>
<td>0.0.0.0.0</td>
<td>0.0.0.0.0</td>
<td>0.0.0.0.0</td>
<td>0.0.0.0.0</td>
<td>0.0.0.0.0</td>
</tr>
<tr>
<td>RETAIN</td>
<td>828391.67</td>
<td>874542.09</td>
<td>920692.50</td>
<td>966842.92</td>
<td>1012993.33</td>
</tr>
<tr>
<td>T NW/L</td>
<td>1374972.46</td>
<td>1451573.36</td>
<td>1528174.26</td>
<td>1604775.16</td>
<td>1681376.06</td>
</tr>
</tbody>
</table>
Next, the computer provides the user with another pro-forma balance sheet. This statement assumes a constant relationship between individual assets and total assets. A similar relationship is assumed between individual liabilities and total net worth plus liabilities. The computer projects a growth pattern of total asset and net worth plus liabilities, by using regresional analysis. If these projections are not considered appropriate, the user may enter other projections.

These two different types of projected balance sheets should help the loan officer determine the amount of permanent working capital that is needed as sales increase.

<table>
<thead>
<tr>
<th>TOTAL ASSET Projection</th>
<th>1217100.00</th>
<th>1245800.00</th>
<th>1274500.00</th>
<th>1303200.00</th>
<th>1331900.00</th>
</tr>
</thead>
</table>

Balance Sheet Projections based on a Total Asset and Total Net Worth relationship for the Year

<table>
<thead>
<tr>
<th>CASH</th>
<th>46103.35</th>
<th>47190.50</th>
<th>48277.65</th>
<th>49364.79</th>
<th>50451.94</th>
</tr>
</thead>
<tbody>
<tr>
<td>INV</td>
<td>628672.97</td>
<td>643497.48</td>
<td>658321.99</td>
<td>673146.51</td>
<td>687971.02</td>
</tr>
<tr>
<td>A/R</td>
<td>175512.82</td>
<td>179651.52</td>
<td>183790.23</td>
<td>187928.93</td>
<td>192067.64</td>
</tr>
<tr>
<td>OCASET</td>
<td>16930.05</td>
<td>17329.27</td>
<td>17728.50</td>
<td>18127.72</td>
<td>18526.94</td>
</tr>
<tr>
<td>TOTCA</td>
<td>867219.19</td>
<td>887668.76</td>
<td>908118.36</td>
<td>928567.95</td>
<td>949017.53</td>
</tr>
<tr>
<td>FASSET</td>
<td>349880.81</td>
<td>358131.22</td>
<td>366381.64</td>
<td>374632.05</td>
<td>382882.47</td>
</tr>
<tr>
<td>TOTASS</td>
<td>1217100.00</td>
<td>1245800.00</td>
<td>1274500.00</td>
<td>1303200.00</td>
<td>1331900.00</td>
</tr>
<tr>
<td>A/P</td>
<td>107477.47</td>
<td>110011.86</td>
<td>112546.25</td>
<td>115080.63</td>
<td>117615.02</td>
</tr>
<tr>
<td>OCLAB</td>
<td>33629.69</td>
<td>34422.70</td>
<td>35215.71</td>
<td>36008.72</td>
<td>36801.72</td>
</tr>
<tr>
<td>TOTCT</td>
<td>141107.16</td>
<td>144434.55</td>
<td>147761.95</td>
<td>151089.35</td>
<td>154416.75</td>
</tr>
<tr>
<td>LTLLAB</td>
<td>112352.45</td>
<td>115001.79</td>
<td>117651.13</td>
<td>120300.48</td>
<td>122949.82</td>
</tr>
<tr>
<td>CSTK</td>
<td>232794.09</td>
<td>238283.52</td>
<td>243772.96</td>
<td>249262.39</td>
<td>254751.63</td>
</tr>
<tr>
<td>PFD</td>
<td>0.</td>
<td>0.</td>
<td>0.</td>
<td>0.</td>
<td>0.</td>
</tr>
<tr>
<td>RETAIN</td>
<td>730846.31</td>
<td>748080.13</td>
<td>765313.96</td>
<td>782547.78</td>
<td>799781.61</td>
</tr>
<tr>
<td>T NW/L</td>
<td>1217100.00</td>
<td>1245800.00</td>
<td>1274500.00</td>
<td>1303200.00</td>
<td>1331900.00</td>
</tr>
</tbody>
</table>
At this point of execution, the model presents a pro-forma income statement and cash flow statements. The projected net income is calculated by assuming a constant relationship between expenses and sales. The projected sales in this procedure are determined by regresional analysis of past sales, or if these projections are not accurate, the user may enter his own projections. The procedure next projects the cash flow for five future years. The computer then derives the amount of cash available after current debt payments and proposed debt payments are paid. This statement helps the loan officer analyze projected cash flows to determine if the company can generate enough cash to repay the new loan along with current loan obligations.

Before the program can execute the user must enter certain data. The user must enter the amount of the loan requested, the interest rate and the length of time that the funds are to be borrowed. Procedure also requires a knowledge of current debt payments and the amount of projected depreciation to be taken for the next five years.

```load(Dave91,lb)
* PROGRAM NOT FOUND.
endDave91,lb)
```
Enter the amount of new debt requested.
db
?100000

Enter the interest rate and the term of the new loan.
R
?.13
Pb
$50

Please enter the approximate amount of depreciation to be taken in the next five years.
dep(1)
?30000
dep(2)
?30000
dep(3)
?30000
dep(4)
?29000
dep(5)
?29000

Projected Income for Years

<table>
<thead>
<tr>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
</tr>
</thead>
<tbody>
<tr>
<td>SALPRO</td>
<td>2003200</td>
<td>2114800</td>
<td>2226400</td>
<td>2338000</td>
</tr>
<tr>
<td>CGS</td>
<td>1429580</td>
<td>1509220</td>
<td>1588860</td>
<td>1668500</td>
</tr>
<tr>
<td>MARGIN</td>
<td>573624</td>
<td>605581</td>
<td>637538</td>
<td>669495</td>
</tr>
<tr>
<td>OP EXP</td>
<td>488739</td>
<td>515967</td>
<td>543195</td>
<td>570423</td>
</tr>
<tr>
<td>EBIT</td>
<td>848885</td>
<td>89614</td>
<td>94343</td>
<td>99072</td>
</tr>
<tr>
<td>INTEXP</td>
<td>14000</td>
<td>14000</td>
<td>14000</td>
<td>14000</td>
</tr>
<tr>
<td>EBT</td>
<td>70885</td>
<td>75614</td>
<td>80343</td>
<td>85072</td>
</tr>
<tr>
<td>TAXES</td>
<td>14150</td>
<td>14938</td>
<td>15727</td>
<td>16515</td>
</tr>
<tr>
<td>NI</td>
<td>56735</td>
<td>60675</td>
<td>64616</td>
<td>68557</td>
</tr>
</tbody>
</table>

| NI | 56735 | 60675 | 64616 | 68557 | 72497 |
| DEPRICATION | 30000 | 30000 | 30000 | 29000 | 29000 |
| CHANGE TOTCA | 109480 | 51894 | 51894 | 51893 | 51893 |
| CHANGE TOTCT | -50736 | 8706 | 8706 | 8706 | 8706 |
| CASH FLOW | -73481 | 47487 | 51428 | 54369 | 58310 |

CASH AVA FOR DEBT

PAYOUTS AND DIVIDENDS

CURRENT DEBT PAYMENT

NEW DEBT PAYMENT

INTEXP ON NEW DEBT

PRINCIPLE ON NEW DEBT

CASH AVAILABLE AFTER DEBT PAYMENTS

The last output of the model is a projected cash budget for the next year. After the computer has compared monthly revenue and monthly operating expenses, the model prints an orderly statement showing the monthly cash needs of the business. This statement reflects the seasonal nature of the business and whether a line of credit is needed to meet monthly operating payments. These monthly deficits, if any, should be financed with short-term funds, and should always be repaid from conversion of working capital.
We will now perform a monthly Cash Budget. You must enter certain new data, consisting of Mont months plus the monthly sales for the last 2 months just completed, Total Operating Expenses and outlays. These accounts will be defined below.

**Monthly Sales (onsal)** consists of your projected monthly sales of the next 12 months period.

**Total Operating Expenses (tox)** consists of purchases of material, salaries, labor expenses and other Monthly Expenses.

**Other Monthly Expenses** consists of taxes, dividends and repayment of current debt.

What is your interest rate on the line of credit?

.13

Please enter the last 2 months sales first and then enter the projected sales for the next 12 months:

<table>
<thead>
<tr>
<th>Month</th>
<th>Sales</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>60000</td>
</tr>
<tr>
<td>2</td>
<td>60000</td>
</tr>
<tr>
<td>3</td>
<td>60000</td>
</tr>
<tr>
<td>4</td>
<td>70000</td>
</tr>
<tr>
<td>5</td>
<td>105000</td>
</tr>
<tr>
<td>6</td>
<td>150000</td>
</tr>
<tr>
<td>7</td>
<td>250000</td>
</tr>
<tr>
<td>8</td>
<td>351000</td>
</tr>
<tr>
<td>9</td>
<td>400000</td>
</tr>
<tr>
<td>10</td>
<td>400000</td>
</tr>
<tr>
<td>11</td>
<td>185000</td>
</tr>
<tr>
<td>12</td>
<td>790000</td>
</tr>
<tr>
<td>13</td>
<td>750000</td>
</tr>
<tr>
<td>14</td>
<td>750000</td>
</tr>
</tbody>
</table>

Please enter the monthly Cash Operating outlays projected for the next 12 months as defined above:

<table>
<thead>
<tr>
<th>Month</th>
<th>Outlays</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>60000</td>
</tr>
<tr>
<td>2</td>
<td>10000</td>
</tr>
<tr>
<td>3</td>
<td>20000</td>
</tr>
<tr>
<td>4</td>
<td>30000</td>
</tr>
<tr>
<td>5</td>
<td>55000</td>
</tr>
<tr>
<td>6</td>
<td>75000</td>
</tr>
<tr>
<td>7</td>
<td>75000</td>
</tr>
<tr>
<td>8</td>
<td>90000</td>
</tr>
<tr>
<td>9</td>
<td>50000</td>
</tr>
<tr>
<td>10</td>
<td>5000</td>
</tr>
<tr>
<td>11</td>
<td>5000</td>
</tr>
<tr>
<td>12</td>
<td>5000</td>
</tr>
<tr>
<td>13</td>
<td>5000</td>
</tr>
<tr>
<td>14</td>
<td>5000</td>
</tr>
</tbody>
</table>
Other monthly Cash Payments in the month to be paid:

- av(1)
- av(2)
- av(3)
- 00
- av(4)
- av(5)
- av(6)
- 000
- av(7)
- av(8)
- av(9)
- 000
- av(10)
- av(11)
- av(12)

ed to know the minimum cash balance desired.

- 100

- Percentage of Total Operating Expenses are allocated to material purchases.

- Percentage of sales are collected in first month of sales, second month and third month.

- ct(1)
- ct(2)
- ct(3)

ur beginning cash balance.

- al
- 00
<table>
<thead>
<tr>
<th></th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
<th>8</th>
<th>9</th>
<th>10</th>
<th>11</th>
<th>12</th>
<th>TOTAL</th>
</tr>
</thead>
<tbody>
<tr>
<td>MONTHLY SALES</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>PURCHASES</td>
<td>48000</td>
<td>64000</td>
<td>96000</td>
<td>104000</td>
<td>204000</td>
<td>300000</td>
<td>260000</td>
<td>152000</td>
<td>120000</td>
<td>68000</td>
<td>52000</td>
<td>52000</td>
<td>1519999</td>
</tr>
<tr>
<td>EXPENSES</td>
<td>12000</td>
<td>16000</td>
<td>24000</td>
<td>26000</td>
<td>51000</td>
<td>75000</td>
<td>65000</td>
<td>38000</td>
<td>30000</td>
<td>17000</td>
<td>13000</td>
<td>13000</td>
<td>380000</td>
</tr>
<tr>
<td>NET CASH GAIN(LOSS)</td>
<td>0</td>
<td>-13000</td>
<td>-31500</td>
<td>-3000</td>
<td>-39500</td>
<td>-114300</td>
<td>50200</td>
<td>45100</td>
<td>39500</td>
<td>41300</td>
<td>25800</td>
<td>-12600</td>
<td></td>
</tr>
<tr>
<td>BEGINNING BALANCE</td>
<td>14000</td>
<td>14000</td>
<td>10000</td>
<td>-30500</td>
<td>-27500</td>
<td>-67000</td>
<td>-181300</td>
<td>-131100</td>
<td>-66001</td>
<td>-26501</td>
<td>14799</td>
<td>40599</td>
<td></td>
</tr>
<tr>
<td>CUMMULATIVE CASH</td>
<td>14000</td>
<td>14000</td>
<td>10000</td>
<td>-30500</td>
<td>-27500</td>
<td>-67000</td>
<td>-181300</td>
<td>-131100</td>
<td>-66001</td>
<td>-26501</td>
<td>14799</td>
<td>40599</td>
<td>27999</td>
</tr>
<tr>
<td>DESIRED LEVEL OF CASH</td>
<td>15000</td>
<td>15000</td>
<td>15000</td>
<td>15000</td>
<td>15000</td>
<td>15000</td>
<td>15000</td>
<td>15000</td>
<td>15000</td>
<td>15000</td>
<td>15000</td>
<td>15000</td>
<td></td>
</tr>
<tr>
<td>INTEXP ON LINE OF CREDIT</td>
<td>-11</td>
<td>-152</td>
<td>-493</td>
<td>-460</td>
<td>-888</td>
<td>-2127</td>
<td>-1583</td>
<td>-878</td>
<td>9</td>
<td>-2</td>
<td>0</td>
<td>0</td>
<td></td>
</tr>
<tr>
<td>TOTAL LOANS NEEDED</td>
<td>-1011</td>
<td>-14152</td>
<td>-45993</td>
<td>-42961</td>
<td>-82889</td>
<td>-198427</td>
<td>-147683</td>
<td>-81878</td>
<td>-41950</td>
<td>-203</td>
<td>25599</td>
<td>12999</td>
<td></td>
</tr>
<tr>
<td>CASH FLOW FROM OPERATIONS</td>
<td>6957</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
When the program has completed execution, the loan officer has an analysis of historical financial statements to examine for trends and proper financing patterns. Pro-forma financial information is also provided to help predict the future. The monthly cash budget information can give the loan officer an idea of the type and amount of financing needed for current assets. With this system of inputs and outputs, the loan officer has an organized set of aids to assist in his credit decision process.

The loan officer can infer from the sample case (Limber Lumber) that it is questionable, whether the $100,000 loan should be made. Limber Lumber will just barely generate enough cash to meet the future debt payments, if the loan is made. Closer analysis must be made in this situation, by the loan officer. The monthly cash budget sheet reflects that a line of credit of $151,042 is needed to meet seasonal needs. It appears the line of credit should possible be extended to $175,000 to give Limber Lumber some flexibility in their cash management.

The overall evaluation of the firm reveals that it is a fairly sound business, which has some problems in cash management policy and there appears to be a need for increased permanent working capital. A term loan should be made to Limber Lumber, but the amount should be reduced from the $100,000 total so that the company will be able to meet debt payment.

While there are many qualitative and behavioral factors involved in any credit decision, the model presented in the above discussion can help with many of the analytical aspects in judging credit worthiness. Such models would seem to have considerable potential in the world of
commercial bank lending to facilitate lending decisions.

Summary

The model is designed to function as an aid to the loan officers in their credit analysis of customers. The programs that made up the model are written in CPS/PL1 for use on an IBM 360 computer. The time sharing aspect of the model makes it economically feasible for banks to use. The model enables the loan officer to utilize the power and speed of the computer in a conversational manner. Sufficient instructions are provided, so that once loaded and executed, the model "leads" the user through completion. Only a minimal amount of computer knowledge is required to operate this model.

The fast and complete analysis of loan customers at a reasonable cost will enhance the profit objectives of banks. This model should provide one of the tools that are needed by bankers to improve the quality of their loan portfolios.
CHAPTER V

CONCLUSION AND SUMMARY

Banks must develop greater sophistication in their credit analysis and decision procedures, if they desire to maintain the same levels of profits as in past years. The risk associated with commercial lending has increased in recent years, mainly because of the instability and complexity of the environment, the longer term of loans and the higher cost of funds.

The increased risk requires in-depth analysis of loan customers, but because of the rapidly changing environment credit decisions must be made rapidly. The means for banks to solve this dilemma is to develop computer models.

This project was undertaken to create a model to assist banks in their commercial loan decisions. The model provides the loan officer with an orderly arrangement of the financial data needed to perform a credit analysis on a business. Final evaluation of the model developed in this paper will depend on actual usage in a number of trial credit analysis by loan officers. The effectiveness of the model can only be determined by testing the model in actual credit decisions.
BIBLIOGRAPHY


2. Ibid. pp. 9-10.


10. Ibid. p. 20


13. Ensign. pp. 18-33


17. Ibid. p. 41.


20. Ibid. p. 221


23. Ibid. p. 41


APPENDIX

LISTING OF COMPUTER PROGRAMS
DECLARE Dave1 ENTRY EXT;
DECLARE Dave2a ENTRY EXT;
DECLARE Dave2b ENTRY EXT;
DECLARE Dave2c ENTRY EXT;
DECLARE Dave2d ENTRY EXT;
DECLARE Dave2e ENTRY EXT;
DECLARE Dave3 ENTRY EXT;
DECLARE Dave4 ENTRY EXT;
DECLARE Dave5 ENTRY EXT;
DECLARE Dave6 ENTRY EXT;
DECLARE Dave7 ENTRY EXT;
DECLARE Dave8 ENTRY EXT;
DECLARE Dave9 ENTRY EXT;

CALL Dave1;
RELEASE;

DECLARE depr(S);
EXT;
EXH
Exn
EXn
EXH
EXH
EXn
EXT;

PUT LIST('The computer will now print-out the information just read into the computer showing Balance Sheets, N ');

PUT LIST('Income Statements and Cash Flow Statements. ');

CALL Dave2a(derr);
RELEASE;

CALL Dave2b(derr);
RELEASE;

IF upcase(ans)='YES' THEN GO TO heat;

IF upcase(ans)='NO' THEN GO TO there; ELSE GO TO hot;

heat: CALL Dave2c;
RELEASE;

CALL Dave2d;
RELEASE;

CALL Dave2e;
RELEASE;

CALL Dave3;
RELEASE;

CALL Dave4;
RELEASE;

PUT LIST('The programs listed below are part of the analysis but because of technical constraints limiting to size

PUT LIST('on the OSU computer system you must load and execute these programs yourself. Follow the instruction belo

PUT LIST('have no problems!');

PUT LIST('');

PUT LIST('Types of Additional Programs

PUT LIST('Proforma Balance Sheets (Sales Relationship) Dave85');

PUT LIST('Proforma Balance Sheets (Asset and N Worth Relationship) Dave87');

PUT LIST('Proforma Income Statements Dave9');

PUT LIST('Monthly Cash Budget Dave93');

PUT LIST('The programs that you desire to execute load in the following manner. ');

PUT LIST('');

PUT LIST('Type in this statement --- load(Dave93)');

PUT LIST('Wait for the computer to answer then type in xeo');

PUT LIST('');

PUT LIST('For each additional program you wish to use just type in the key for loading and xeo to start the program

?
DECLARE @balli FILE OUTPUT ENV( V(120) )
DECLARE cash(5) DEC(6)
DECLARE inv(5) DEC(6)
DECLARE ar(5) DEC(6)
DECLARE ocase(5) DEC(6)
DECLARE fasset(5) DEC(6)
DECLARE ar(5) DEC(6)
DECLARE ocliab(5) DEC(6)
DECLARE ltlilab(5) DEC(6)
DECLARE cstk(5) DEC(6)
DECLARE pfd(5) DEC(6)
DECLARE retain(5) DEC(6)
DECLARE sales(5) DEC(6)
DECLARE cds(5) DEC(6)
DECLARE tox(5) DEC(6)
DECLARE intexp(5) DEC(6)
DECLARE taxes(5) DEC(6)

PUT LIST('This is a program to be used in a Credit Analysis of any business loan request.');

PUT LIST('The user will be asked to enter information into the computer.');

PUT LIST('This information will be requested in the form of summary accounts. Listed below is a list.');

PUT LIST('of the accounts used by the program. Please arrange your financial data to fit into these accounts.');

PUT LIST('ACCOUNT GROUPINGS ABBREVIATIONS USED');

PUT LIST('ACCOUNT RECEIVABLES -- A/R');
PUT LIST('INVENTORIES ----- INV');
PUT LIST('OTHER CURRENT ASSETS -- OCASET');
PUT LIST('NET FIXED ASSETS ------- FASET');
PUT LIST('ACCOUNT PAYABLE ------ A/P');
PUT LIST('OTHER CURRENT LIAB ----- OCLIAB');
PUT LIST('LONG-TERM LIAB ------- LTLIAB');
PUT LIST('COMMON STOCK -------- CSTK');
PUT LIST('PREFERRED STOCK ------ PFD');
PUT LIST('RETAIL EARNINGS ------ RETAIN');
PUT LIST('SALES ---------------- SALES');
PUT LIST('COST OF GOODS SOLD ---- CGS');
PUT LIST('TOTAL OPERATING EXP ---- TOX');
PUT LIST('INTEREST EXPENSE ------ INTEXP');
PUT LIST('TAXES ---------------- TAXES');

PUT LIST('Please enter this information as it is asked for by the computer.');

PUT LIST('The user will be asked yes and no questions; please answer in capital letters.');

PUT LIST('Enter the number of past years of financial data to be analyzed.(max 5 yrs)');
265. PUT LIST('Now enter the Income Statement Data for year', i);
270. PUT LIST('');
275. GET LIST(sales(i), css(i), tox(i), intexp(i), taxes(i));
280. PUT LIST('');
285. PUT LIST('');
290. PUT LIST('');
295. PUT LIST('');
300. END;
355. OPEN FILE(@ball) OUTPUT;
360. WRITE FILE(@ball) FROM (wrs) ;
365. WRITE FILE(@ball) FROM (cash) ;
370. WRITE FILE(@ball) FROM (inv) ;
375. WRITE FILE(@ball) FROM (ar) ;
380. WRITE FILE(@ball) FROM (ocasset) ;
385. WRITE FILE(@ball) FROM (fasset) ;
400. WRITE FILE(@ball) FROM (ap) ;
405. WRITE FILE(@ball) FROM (ocliab) ;
415. WRITE FILE(@ball) FROM (ltlib) ;
425. WRITE FILE(@ball) FROM (cstk) ;
435. WRITE FILE(@ball) FROM (Pfd) ;
445. WRITE FILE(@ball) FROM (retain) ;
450. WRITE FILE(@ball) FROM (css) ;
460. WRITE FILE(@ball) FROM (ttx) ;
470. WRITE FILE(@ball) FROM (intexp) ;
480. WRITE FILE(@ball) FROM (taxes) ;
490. END Davei;
5.02  PUT LIST('');
5.03  PUT LIST('');
10.  DECLARE @ball FILE INPUT ;
15.  DECLARE cash(5) DEC(6);
20.  DECLARE inv(5) DEC(6);
25.  DECLARE ar(5) DEC(6);
30.  DECLARE ocast(5) DEC(6);
40.  DECLARE fasset(5) DEC(6);
50.  DECLARE ar(5) DEC(6);
55.  DECLARE oclab(5) DEC(6);
65.  DECLARE itlib(5) DEC(6);
70.  DECLARE cstk(5) DEC(6);
75.  DECLARE pfd(5) DEC(6);
80.  DECLARE retain(5) DEC(6);
90.  DECLARE sales(5) DEC(6);
92.  DECLARE cs(5) DEC(6);
100. DECLARE tox(5) DEC(6);
110. DECLARE intexP(5) DEC(6);
120. DECLARE taxes(5) DEC(6);
141. DECLARE it(5);
142.  it=0;
145.  imase1: IMAGE;
160.  imase2: IMAGE;
165.  imase3: IMAGE;
166.  imase4: IMAGE;
167.  DECLARE j(10),n(10),w(10);
168.  j=0;
168.1 n=0;
168.2 w=0;
175.  imase8: IMAGE;
180.  OPEN FILE(@ball) INPUT ;
185.  ;
190.  READ FILE(@ball) INTO(wrs) ;
195.  READ FILE(@ball) INTO(cash) ;
200.  READ FILE(@ball) INTO(inv) ;
205.  READ FILE(@ball) INTO(ar) ;
210.  READ FILE(@ball) INTO(ocast) ;
220.  READ FILE(@ball) INTO(fasset) ;
230.  READ FILE(@ball) INTO(ar) ;
235.  READ FILE(@ball) INTO(ocast) ;
245.  READ FILE(@ball) INTO(itlib) ;
250.  READ FILE(@ball) INTO(cstk) ;
255.  READ FILE(@ball) INTO(pfd) ;
260.  READ FILE(@ball) INTO(retain) ;
270.  READ FILE(@ball) INTO(sales) ;
275.  READ FILE(@ball) INTO(cds) ;
285.  READ FILE(@ball) INTO(tox) ;
295.  READ FILE(@ball) INTO(intexP) ;
305.  READ FILE(@ball) INTO(taxes) ;
321.  PUT LIST('') ;
321.2 PUT LIST('To determine the cash flow you must enter the amount of deprecation taken in the preceding years.') ;
321.25 PUT LIST('');
328. 
329. PUT IMAGE('CASH',it(1),it(2),it(3),it(4),it(5))(imase1);
330. 
331. DO i=1 TO yrs;
332. it(i)=inv(i);
333. END;
334. 
335. PUT IMAGE('INVENT',it(1),it(2),it(3),it(4),it(5))(imase1);
336. 
337. DO i=1 TO yrs;
338. it(i)=ar(i);
339. END;
340. 
341. PUT IMAGE('A/R',it(1),it(2),it(3),it(4),it(5))(imase1);
342. 
343. DO i=1 TO yrs;
344. it(i)=ocaset(i); 
345. END;
346. 
347. PUT IMAGE('OCASSET',it(1),it(2),it(3),it(4),it(5))(imase1);
348. 
349. DO i=1 TO yrs;
350. it(i)=cash(i)+inv(i)+ar(i)+ocaset(i);
351. END;
352. 
353. PUT IMAGE('TOTCA',it(1),it(2),it(3),it(4),it(5))(imase1);
354. 
355. DO i=1 TO yrs;
356. it(i)=fasset(i);
357. END;
358. 
359. PUT IMAGE('FASSET',it(1),it(2),it(3),it(4),it(5))(imase1);
360. 
361. DO i=1 TO yrs;
362. it(i)=cash(i)+inv(i)+ar(i)+ocaset(i)+fasset(i);
363. END;
364. 
365. PUT IMAGE('TOTASS',it(1),it(2),it(3),it(4),it(5))(imase1);
366. 
367. PUT LIST('');
368. 
369. PUT LIST('');
370. 
371. PUT IMAGE('A/P',it(1),it(2),it(3),it(4),it(5))(imase1);
372. 
373. DO i=1 TO yrs;
374. it(i)=ocliab(i);
375. END;
376. 
377. PUT IMAGE('OCLIAB',it(1),it(2),it(3),it(4),it(5))(imase1);
378. 
379. DO i=1 TO yrs;
380. it(i)=ar(i)+ocliab(i);
381. END;
382. 
383. PUT IMAGE('TOTCT',it(1),it(2),it(3),it(4),it(5))(imase2);
384. 
385. DO i=1 TO yrs;
386. it(i)=ltlib(i);
387. END;
388. 
389. PUT IMAGE('LTLIB',it(1),it(2),it(3),it(4),it(5))(imase1);
390. 
391. DO i=1 TO yrs;
392. it(i)=cstk(i);
393. END;
394. 
395. PUT IMAGE('CSTK',it(1),it(2),it(3),it(4),it(5))(imase1);
396. 
397. DO i=1 TO yrs;
398. it(i)=pfd(i);
399. END;
400. 
401. PUT IMAGE('PFD',it(1),it(2),it(3),it(4),it(5))(imase1);
402. 
403. DO i=1 TO yrs;
404. it(i)=retain(i);
405. END;
406. 
407. PUT IMAGE('RETAIN',it(1),it(2),it(3),it(4),it(5))(imase1);
408. 
409. DO i=1 TO yrs;
410. it(i)=ap(i)+ocliab(i)+ltlib(i)+cstk(i)+pfd(i)+retain(i);
DECLARE cash(5) DEC(6);
DECLARE inv(5) DEC(6);
DECLARE ar(5) DEC(6);
DECLARE ocase(5) DEC(6);
DECLARE fasset(5) DEC(6);
DECLARE ap(5) DEC(6);
DECLARE oclab(5) DEC(6);
DECLARE cstk(5) DEC(6);
DECLARE Pfd(5) DEC(6);
DECLARE retain(5) DEC(6);
DECLARE sales(5) DEC(6);
DECLARE css(5) DEC(6);
DECLARE tox(5) DEC(6);
DECLARE intexp(5) DEC(6);
DECLARE taxes(5) DEC(6);
DECLARE it(5);

it=0;

DO i=1 TO wrs;
   as(i)=cash(i)/sales(i);
END;

a=(as(1)+as(2)+as(3)+as(4)+as(5))/wrs;

PUT LIST(' Period= 1 2 3 4 5 / AVE');
\begin{verbatim}
471. \( o = (\text{as}(1) + \text{as}(2) + \text{as}(3) + \text{as}(4) + \text{as}(5))/\text{wrs}; \)
472. \text{PUT IMAGE('A/R', as(1), as(2), as(3), as(4), as(5), o)(image8);}
473. DO \text{i=1 TO wrs;}
474. \( \text{as(i)} = \text{ocaset(i)}/\text{sales(i)}; \)
475. END;
476. \( o = (\text{as}(1) + \text{as}(2) + \text{as}(3) + \text{as}(4) + \text{as}(5))/\text{wrs}; \)
477. \text{PUT IMAGE('OCASSET', as(1), as(2), as(3), as(4), as(5), o)(image8);}
478. DO \text{i=1 TO wrs;}
479. \( \text{as(i)} = (\text{cash(i)} + \text{inv(i)} + \text{ar(i)} + \text{ocaset(i)})/\text{sales(i)}; \)
480. END;
481. \( o = (\text{as}(1) + \text{as}(2) + \text{as}(3) + \text{as}(4) + \text{as}(5))/\text{wrs}; \)
482. \text{PUT IMAGE('TOTCA', as(1), as(2), as(3), as(4), as(5), o)(image8);}
483. DO \text{i=1 TO wrs;}
484. \( \text{as(i)} = \text{fasset(i)}/\text{sales(i)}; \)
485. END;
486. \( o = (\text{as}(1) + \text{as}(2) + \text{as}(3) + \text{as}(4) + \text{as}(5))/\text{wrs}; \)
487. \text{PUT IMAGE('FASSET', as(1), as(2), as(3), as(4), as(5), o)(image8);}
488. DO \text{i=1 TO wrs;}
489. \( \text{as(i)} = (\text{cash(i)} + \text{inv(i)} + \text{ar(i)} + \text{ocaset(i)} + \text{fasset(i)})/\text{sales(i)}; \)
490. END;
491. \( o = (\text{as}(1) + \text{as}(2) + \text{as}(3) + \text{as}(4) + \text{as}(5))/\text{wrs}; \)
492. \text{PUT IMAGE('TOTASS', as(1), as(2), as(3), as(4), as(5), o)(image8);}
493. DO \text{i=1 TO wrs;}
494. \( \text{as(i)} = \text{ap(i)}/\text{sales(i)}; \)
495. END;
496. \( o = (\text{as}(1) + \text{as}(2) + \text{as}(3) + \text{as}(4) + \text{as}(5))/\text{wrs}; \)
497. \text{PUT IMAGE('A/P', as(1), as(2), as(3), as(4), as(5), o)(image8);}
498. DO \text{i=1 TO wrs;}
499. \( \text{as(i)} = \text{ocliab(i)}/\text{sales(i)}; \)
500. END;
501. \( o = (\text{as}(1) + \text{as}(2) + \text{as}(3) + \text{as}(4) + \text{as}(5))/\text{wrs}; \)
502. \text{PUT IMAGE('OCLIAB', as(1), as(2), as(3), as(4), as(5), o)(image8);}
503. DO \text{i=1 TO wrs;}
504. \( \text{as(i)} = (\text{ap(i)} + \text{ocliab(i)})/\text{sales(i)}; \)
505. END;
506. \( o = (\text{as}(1) + \text{as}(2) + \text{as}(3) + \text{as}(4) + \text{as}(5))/\text{wrs}; \)
507. \text{PUT IMAGE('TOTCT', as(1), as(2), as(3), as(4), as(5), o)(image8);}
508. DO \text{i=1 TO wrs;}
509. \( \text{as(i)} = \text{ltlib(i)}/\text{sales(i)}; \)
510. END;
511. \( o = (\text{as}(1) + \text{as}(2) + \text{as}(3) + \text{as}(4) + \text{as}(5))/\text{wrs}; \)
512. \text{PUT IMAGE('LTLIB', as(1), as(2), as(3), as(4), as(5), o)(image8);}
513. DO \text{i=1 TO wrs;}
514. \( \text{as(i)} = \text{cstk(i)}/\text{sales(i)}; \)
515. END;
516. \( o = (\text{as}(1) + \text{as}(2) + \text{as}(3) + \text{as}(4) + \text{as}(5))/\text{wrs}; \)
517. \text{PUT IMAGE('CSTK', as(1), as(2), as(3), as(4), as(5), o)(image8);}
518. DO \text{i=1 TO wrs;}
519. \( \text{as(i)} = \text{pfd(i)}/\text{sales(i)}; \)
520. END;
521. \( o = (\text{as}(1) + \text{as}(2) + \text{as}(3) + \text{as}(4) + \text{as}(5))/\text{wrs}; \)
522. \text{PUT IMAGE('PFD', as(1), as(2), as(3), as(4), as(5), o)(image8);}
523. DO \text{i=1 TO wrs;}
524. \( \text{as(i)} = \text{retain(i)}/\text{sales(i)}; \)
525. END;
526. \( o = (\text{as}(1) + \text{as}(2) + \text{as}(3) + \text{as}(4) + \text{as}(5))/\text{wrs}; \)
527. \text{PUT IMAGE('RETAI', as(1), as(2), as(3), as(4), as(5), o)(image8);}
528. \end{verbatim}
123. PUT IMAGE('PFD',J(1),J(2),J(3),J(4),J(5),a)(image1);
124. DO i=1 TO yrs;
125. J(i)=retain(i)/n(i);
126. END;
127. a=(J(1)+J(2)+J(3)+J(4)+J(5))/yrs;
128. PUT IMAGE('RETAIN',J(1),J(2),J(3),J(4),J(5),a)(image1);
129. DO i=1 TO yrs;
130. J(i)=(ap(i)+oclib(i)+ltlib(i)+cstk(i)+fpl(i)+retain(i))/n(i);
131. END;
132. a=(J(1)+J(2)+J(3)+J(4)+J(5))/yrs;
133. PUT IMAGE('T NW/L',J(1),J(2),J(3),J(4),J(5),a)(image1);
134. PUT LIST('');
135. PUT LIST('');
136. CLOSE FILE('bail');
137. there;
138. END Dave2c\t
139. END Dave2c
Dave: PROCEDURE (def1):
DECLARE @ball1 FILE INPUT;
DECLARE cash(5) DEC(6);
DECLARE inv(5) DEC(6);
DECLARE ar(5) DEC(6);
DECLARE ocaset(5) DEC(6);
DECLARE fasset(5) DEC(6);
DECLARE aroC5) DEC(6);
DECLARE ocliab(5) DEC(6);
DECLARE ltlib(5) DEC(6);
DECLARE cstk(5) DEC(6);
DECLARE Pfd(5) DEC(6);
DECLARE retain(5) DEC(6);
DECLARE sales(5) DEC(6);
DECLARE css(5) DEC(6);
DECLARE tox(5) DEC(6);
DECLARE intexp(5) DEC(6);
DECLARE taxes(5) DEC(6);
DO i=1 TO vrs;
it(i)=sales(i);END;
PUT IMAGE('SALES';it(1),it(2),it(3),it(4),it(5))(image3)
it(i)=tox(i);

END;

PUT IMAGE('OP EXP',it(1),it(2),it(3),it(4),it(5))(image3);
DO i=1 TO yrs;
  it(i)=sales(i)-css(i)-tox(i);
END;

PUT IMAGE('EBIT',it(1),it(2),it(3),it(4),it(5))(image3);
DO i=1 TO yrs;
  it(i)=intexp(i);
END;

PUT IMAGE('EBIT',it(1),it(2),it(3),it(4),it(5))(image3);
DO i=1 TO yrs;
  it(i)=taxes(i);
END;

PUT IMAGE('TAXES',it(1),it(2),it(3),it(4),it(5))(image3);
DO i=1 TO yrs;
  it(i)=depr(i);
END;

J(i+1)=inv(i+1)+ar(i+1)+ociset(i+1)-inv(i)-ar(i)-ociset(i);
R(i+1)=ap(i+1)+ocliab(i+1)-ap(i)-ocliab(i);
END;

PUT IMAGE('CHANGE TOTCA',J(2),J(3),J(4),J(5))(image4);
PUT IMAGE('CHANGE TOTCT',R(2),R(3),R(4),R(5))(image4);
DO i=2 TO yrs;
  w(i)=sales(i)-css(i)-tox(i)-intexp(i)-taxes(i)-depr(i)-J(i)+n(i);
END;

PUT IMAGE('CASH FLOW',w(2),w(3),w(4),w(5))(image4);
PUT LIST('');
PUT LIST('');
PUT LIST('');

CLOSE FILE('ba11');
END;

END Dave2b;
DECLARE inv(5) DEC(6);
DECLARE ar(5) DEC(6);
DECLARE ocaset(5) DEC(6);
DECLARE fasset(5) DEC(6);
DECLARE ar(5) DEC(6);
DECLARE ocset(5) DECC6);}
DECLARE fasset(5) DEC(6);}
DECLARE ar(5) DECC6);}
DECLARE ap(5) DECC6);}
DECLARE oclab(5) DEC(6);
DECLARE it<5>;}
DECLARE it=o;
imase1: IMAGE;
imase2: IMAGE;
imase3: IMAGE;
imase8: IMAGE;
OPEN FILE@bal1) INPUT;
READ FILE@bal1) INTO(wrs);}
READ FILE@bal1) INTO(cash);}
READ FILE@bal1) INTO(inv);}
READ FILE@bal1) INTO(ar);}
READ FILE@bal1) INTO(ocset);}
READ FILE@bal1) INTO(fasset);}
READ FILE@bal1) INTO(ar);}
READ FILE@bal1) INTO(ocset);}
READ FILE@bal1) INTO(itlib);}
READ FILE@bal1) INTO(cstk);}
READ FILE@bal1) INTO(ap);}
READ FILE@bal1) INTO(retain);}
READ FILE@bal1) INTO(sales);}
READ FILE@bal1) INTO(cstk);}
READ FILE@bal1) INTO(tox);}
READ FILE@bal1) INTO(intexp);}
READ FILE@bal1) INTO(taxes);}
as=0;
as=0;
DECLARE as(10) DEC(6);
r=0;
PUT LIST('');
DO i=1 TO wrs;
as(i)=sales(i)/sales(i);
END;
r=(as(1)+as(2)+as(3)+as(4)+as(5))/wrs;
PUT IMAGE('SALES',as(1),as(2),as(3),as(4),as(5),r)(image8);
DO i=1 TO wrs;
as(i)=css(i)/sales(i);
as(i)=tox(i)/sales(i);
END;

r=(as(1)+as(2)+as(3)+as(4)+as(5))/wrs;
PUT IMAGE('OP EXP',as(1),as(2),as(3),as(4),as(5),r)(image8);
DO i=1 TO yrs;
as(i)=(sales(i)-css(i)-tox(i))/sales(i);
END;

r=(as(1)+as(2)+as(3)+as(4)+as(5))/wrs;
PUT IMAGE('EBIT',as(1),as(2),as(3),as(4),as(5),r)(image8);
DO i=1 TO yrs;
as(i)=intexp(i)/sales(i);
END;

r=(as(1)+as(2)+as(3)+as(4)+as(5))/wrs;
PUT IMAGE('INT EXP',as(1),as(2),as(3),as(4),as(5),r)(image8);
DO i=1 TO yrs;
as(i)=taxes(i)/sales(i);
END;

r=(as(1)+as(2)+as(3)+as(4)+as(5))/wrs;
PUT IMAGE('NI',as(1),as(2),as(3),as(4),as(5),r)(image8);
CLOSE FILE('bal1')
END;

END Dave2d;
3. PUT LIST('');
4. PUT LIST('');
5. DECLARE ans CHAR(3) VAR;
6. here:
7. PUT LIST('Do you wish to see a print-out of the comparative Balance Sheet comparing the accounts?');
8. PUT LIST('to Total Assets and Total Net Worth-Liabilities?');
9. PUT LIST(ans); IF upcase(ans)='YES' THEN GO TO start;
10. IF upcase(ans)='NO' THEN GO TO there; ELSE GO TO here;
11. start:;
12. DECLARE @ball FILE INPUT;
13. DECLARE cash(5) DEC(6);
14. DECLARE inv(5) DEC(6);
15. DECLARE ar(5) DEC(6);
16. DECLARE ocseset(5) DEC(6);
17. DECLARE fastet(5) DEC(6);
18. DECLARE ap(5) DEC(6);
19. DECLARE ocliab(5) DEC(6);
20. DECLARE ltlab(5) DEC(6);
21. DECLARE cstk(5) DEC(6);
22. DECLARE pfd(S) DEC(6);
23. DECLARE retain(S) DEC(6);
24. DECLARE sales(S) DEC(6);
25. DECLARE css(S) DEC(6);
26. DECLARE tox(S) DEC(6);
27. DECLARE intexp(5) DEC(6);
28. DECLARE taxes(S) DEC(6);
29. DECLARE J(10); 
30. DECLARE n(10); 
31. DECLARE w(10); 
32. image: IMAGE; 
33. OPEN FILE(@ball) INPUT;
34. READ FILE(@ball) INTO(wrs); 
35. READ FILE(@ball) INTO(cash); 
36. READ FILE(@ball) INTO(inv); 
37. READ FILE(@ball) INTO(ar); 
38. READ FILE(@ball) INTO(ocseset); 
39. READ FILE(@ball) INTO(fastet); 
40. READ FILE(@ball) INTO(ap); 
41. READ FILE(@ball) INTO(ocliab); 
42. READ FILE(@ball) INTO(ltlab); 
43. READ FILE(@ball) INTO(cstk); 
44. READ FILE(@ball) INTO(pfd); 
45. READ FILE(@ball) INTO(retain); 
46. READ FILE(@ball) INTO(sales); 
47. READ FILE(@ball) INTO(css); 
48. READ FILE(@ball) INTO(taxes); 
49. PUT LIST('');
50. PUT LIST('');
51. PUT LIST('Periods= 1 2 3 4 5 AVE');
52. PUT LIST('');
53. DO i=1 TO yrs;
54. w(i)=cash(i)+inv(i)+ar(i)+ocseset(i)+fastet(i);
55. n(i)=ap(i)+ocliab(i)+ltlab(i)+cstk(i)+pfd(i)+retain(i);
56. END;
J(i) = inv(i)/y(i);
END;
a = (J(1) + J(2) + J(3) + J(4) + J(5))/yrs;
PUT IMAGE('INVENT', J(1), J(2), J(3), J(4), J(5), a)(image1);
DO i=1 TO yrs;
   J(i) = ar(i)/w(i);
END;
a = (J(1) + J(2) + J(3) + J(4) + J(5))/yrs;
PUT IMAGE('A/R', J(1), J(2), J(3), J(4), J(5), a)(image1);
DO i=1 TO yrs;
   J(i) = ocast(i)/w(i);
END;
a = (J(1) + J(2) + J(3) + J(4) + J(5))/yrs;
PUT IMAGE('OCASSET', J(1), J(2), J(3), J(4), J(5), a)(image1);
DO i=1 TO yrs;
   J(i) = (cash(i) + inv(i) + ar(i) + ocast(i))/w(i);
END;
a = (J(1) + J(2) + J(3) + J(4) + J(5))/yrs;
PUT IMAGE('A/P', J(1), J(2), J(3), J(4), J(5), a)(image1);
DO i=1 TO yrs;
   J(i) = ap(i)/n(i);
END;
a = (J(1) + J(2) + J(3) + J(4) + J(5))/yrs;
PUT IMAGE('A/P', J(1), J(2), J(3), J(4), J(5), a)(image1);
DO i=1 TO yrs;
   J(i) = oclab(i)/n(i);
END;
a = (J(1) + J(2) + J(3) + J(4) + J(5))/yrs;
PUT IMAGE('OCASSET', J(1), J(2), J(3), J(4), J(5), a)(image1);
DO i=1 TO yrs;
   J(i) = ocast(i)/n(i);
END;
a = (J(1) + J(2) + J(3) + J(4) + J(5))/yrs;
PUT IMAGE('OCASSET', J(1), J(2), J(3), J(4), J(5), a)(image1);
DO i=1 TO yrs;
   J(i) = oclab(i)/n(i);
END;
a = (J(1) + J(2) + J(3) + J(4) + J(5))/yrs;
PUT IMAGE('OCASSET', J(1), J(2), J(3), J(4), J(5), a)(image1);
DO i=1 TO yrs;
   J(i) = oclab(i)/n(i);
END;
a = (J(1) + J(2) + J(3) + J(4) + J(5))/yrs;
PUT IMAGE('OCASSET', J(1), J(2), J(3), J(4), J(5), a)(image1);
DO i=1 TO yrs;
   J(i) = oclab(i)/n(i);
END;
a = (J(1) + J(2) + J(3) + J(4) + J(5))/yrs;
PUT IMAGE('A/P', J(1), J(2), J(3), J(4), J(5), a)(image1);
DO i=1 TO yrs;
   J(i) = ap(i)/n(i);
END;
a = (J(1) + J(2) + J(3) + J(4) + J(5))/yrs;
PUT IMAGE('A/P', J(1), J(2), J(3), J(4), J(5), a)(image1);
DO i=1 TO yrs;
   J(i) = oclab(i)/n(i);
END;
128. PUT IMAGE('RETAIN', J(1), J(2), J(3), J(4), J(5), a)(imadel)
129. DO i=1 TO yrs;
130. J(i)=(ar(i)+ocl(i)+ltlib(i)+cstk(i)+fd(i)+retain(i))/n(i);
131. END;
132. a=(J(1)+J(2)+J(3)+J(4)+J(5))/yrs;
133. PUT IMAGE('T NW/L', J(1), J(2), J(3), J(4), J(5), a)(imadel);
134. PUT LIST('');
135. PUT LIST('');
136. PUT LIST('');
137. CLOSE FILE(@ball);
138. there !;
139. END Dave25;
PUT LIST('');

PUT LIST('');

PUT LIST('');

DECLARE ans CHAR(3) VAR;

PUT LIST('Do you wish to see a printout of the ratio analysis.');

READ INTO(ans);

IF UPCASE(ans)='YES' THEN GO TO:start;

IF UPCASE(ans)='NO' THEN GO TO here;

start:

DECLARE @ball FILE INPUT;

DECLARE cash(5) DEC(6);

DECLARE inv(5) DEC(6);

DECLARE ar(5) DEC(6);

DECLARE oacset(5) DEC(6);

DECLARE fasset(5) DEC(6);

DECLARE lltlib(5) DEC(6);

DECLARE cssC5) DEC(6);

DECLARE ocliab(5) DEC(6);

DECLARE ltlib(5) DEC(6);

DECLARE Pfd(5) DEC(6);

DECLARE retain(5) DEC(6);

DECLARE sales(5) DEC(6);

DECLARE tox(5) DEC(6);

DECLARE intexp(5) DEC(6);

DECLARE taxes(5) DEC(6);

DECLARE ratio(10) DEC(6);

OPEN FILE(@ball) INPUT;

READ FILE(@ball) INTO(@rs);

READ FILE(@ball) INTO(cash);

READ FILE(@ball) INTO(inv);

READ FILE(@ball) INTO(ar);

READ FILE(@ball) INTO(oacset);

READ FILE(@ball) INTO(fasset);

READ FILE(@ball) INTO(oacset);

READ FILE(@ball) INTO(litlib);

READ FILE(@ball) INTO(ocliab);

READ FILE(@ball) INTO(cstark);

READ FILE(@ball) INTO(css);

READ FILE(@ball) INTO(Pfd);

READ FILE(@ball) INTO(retain);

READ FILE(@ball) INTO(sales);

READ FILE(@ball) INTO(ocs);

READ FILE(@ball) INTO(tax);

READ FILE(@ball) INTO(intexp);

READ FILE(@ball) INTO(taxes);

DECLARE totca(10) DEC(6);

DECLARE totass(10) DEC(6);

DECLARE totct(10) DEC(6);
tnl(i)=cost(i)+fd(i)+retain(i);
margin(i)=sales(i)-cost(i);

ebit(i)=sales(i)-cost(i)-tox(i);

ebt(i)=sales(i)-cost(i)-tox(i)-intexp(i);

ny(i)=sales(i)-cost(i)-tox(i)-intexp(i)-tax(i);

END;

PUT LIST('');
PUT LIST('Periods=  1  2  3  4  5  5');

PUT LIST('');
PUT LIST('ratio=0');
c=r+1;

PUT LIST('');
PUT LIST('LIQUIDITY RATIO');
PUT LIST('');
DO i=1 TO c;
ratio(i)=totca(i)/totct(i);
END;
PUT IMAGE('Current-Ratio',ratio(1),ratio(2),ratio(3),ratio(4),ratio(5))(image5);
DO i=1 TO c;
ratio(i)=(cash(i)+ar(i)+ocaset(i))/totct(i);
END;
PUT IMAGE('Quick-Ratio',ratio(1),ratio(2),ratio(3),ratio(4),ratio(5))(image5);
DO i=1 TO c;
ratio(i)=(inv(i)/(cash(i)+inv(i)+ar(i)+ocaset(i))-ap(i)-ocliab(i));
END;
PUT IMAGE('INV to W.C.',ratio(1),ratio(2),ratio(3),ratio(4),ratio(5))(image6);

PUT LIST('');
PUT IMAGE('LEVERAGE RATIO');
PUT LIST('');
DO i=1 TO c;
ratio(i)=(totct(i)+llib(i))/totass(i);
END;
PUT IMAGE('Debt to Assets',ratio(1),ratio(2),ratio(3),ratio(4),ratio(5))(image6);
DO i=1 TO c;
ratio(i)=ebit(i)/intexp(i);
END;
PUT IMAGE('Intexp to EBIT',ratio(1),ratio(2),ratio(3),ratio(4),ratio(5))(image5);
PUT LIST('');
PUT LIST('');
PUT LIST('');
ACTIVITY RATIO';
PUT LIST('');
DO i=1 TO c;
ratio(i)=ar(i)/(sales(i)/365);
END;
PUT IMAGE('AR/Daily Sales',ratio(1),ratio(2),ratio(3),ratio(4),ratio(5))(image7);
DO i=1 TO c;
ratio(i)=totct(i)/tnl(i);
END;
PUT IMAGE('C. Liab to Net Worth',ratio(1),ratio(2),ratio(3),ratio(4),ratio(5))(image6);
DO i=1 TO c;
ratio(i)=fasset(i)/tnl(i);
END;
PUT IMAGE('F.A. to Net Worth',ratio(1),ratio(2),ratio(3),ratio(4),ratio(5))(image6);
DO i=1 TO c;
ratio(i)=sales(i)/fasset(i);
END;
PUT IMAGE('F.A. Turnover',ratio(1),ratio(2),ratio(3),ratio(4),ratio(5))(image5);
DO i=1 TO c;

ENU ;

PUT IMAGE(‘INV Turnover’,ratio(1),ratio(2),ratio(3),ratio(4),ratio(5))(image5);

PUT LIST(‘’);

PUT LIST(‘’);

PUT LIST(‘ PROFITABILITY RATIOS’);

PUT LIST(‘’);

DO i=1 TO c;
ratio(i)=nu(i)/sales(i);
END;

PUT IMAGE(‘Profit Margin’,ratio(1),ratio(2),ratio(3),ratio(4),ratio(5))(image6);

DO i=1 TO c;
ratio(i)=tox(i)/sales(i);
END;

PUT IMAGE(‘Operating Exp/Sales’,ratio(1),ratio(2),ratio(3),ratio(4),ratio(5))(image6);

DO i=1 TO c;
ratio(i)=nu(i)/totass(i);
END;

PUT IMAGE(‘Return on Assets’,ratio(1),ratio(2),ratio(3),ratio(4),ratio(5))(image6);

DO i=1 TO c;
ratio(i)=nu(i)/tnl(i);
END;

PUT IMAGE(‘Net Worth Return’,ratio(1),ratio(2),ratio(3),ratio(4),ratio(5))(image6);

PUT LIST(‘’);

PUT LIST(‘’);

PUT LIST(‘’);

PUT LIST(‘’);

PUT LIST(‘’);

CLOSE FILE(@ba11);

here: ;

END Dave3;

END
```
2.02 PUT LIST('');
6.1 PUT LIST('Do you wish to see a sources and uses statement?');
6.2 READ INTO(ans)
6.3 IF upcase(ans)='YES' THEN GO TO mon
6.4 IF upcase(ans)='NO' THEN GO TO sun
6.5 PUT LIST('');
6.6 PUT LIST('');
7. mon
10. DECLARE acct CHAR(7) VAR;
11. DECLARE @ball FILE INPUT;
15. DECLARE cash(5) DEC(6);  
16. DECLARE inv(5) DEC(6);  
17. DECLARE ar(5) DEC(6); 
18. DECLARE ocaze(5) DEC(6);  
19. DECLARE fasset(5) DEC(6);  
20. DECLARE ap(5) DEC(6); 
21. DECLARE oclia(5) DEC(6);  
22. DECLARE fasset(5) DEC(6);  
23. DECLARE cstk(5) DEC(6);  
24. DECLARE pfd(5) DEC(6);  
25. DECLARE retai(5) DEC(6);  
26. DECLARE sales(5) DEC(6);  
27. DECLARE csts(5) DEC(6); 
28. DECLARE tox(5) DEC(6);  
29. DECLARE intexp(5) DEC(6);  
30. DECLARE taxes(5) DEC(6);  
155. image8: IMAGE;
160. OPEN FILE(@bal1) INPUT;
165. READ FILE(@bal1) INTO(yrs) ;
170. READ FILE(@bal1) INTO(cash) ;
175. READ FILE(@bal1) INTO(inv) ;
180. READ FILE(@bal1) INTO(ar) ;
185. READ FILE(@bal1) INTO(ocaze) ;
190. READ FILE(@bal1) INTO(fasset) ;
205. READ FILE(@bal1) INTO(ap) ;
210. READ FILE(@bal1) INTO(oclia) ;
220. READ FILE(@bal1) INTO(fasset) ;
230. READ FILE(@bal1) INTO(cstk) ;
235. READ FILE(@bal1) INTO(pfd) ;
240. READ FILE(@bal1) INTO(retai) ;
250. READ FILE(@bal1) INTO(sales) ;
255. READ FILE(@bal1) INTO(csts) ;
265. READ FILE(@bal1) INTO(tox) ;
275. READ FILE(@bal1) INTO(intexp) ;
285. READ FILE(@bal1) INTO(taxes) ;
305. R=1;
310. S=yrs;
315. a=0;
320. d200: PROCEDURE (a);  
325. IF a=0 THEN GO TO d201;
330. b=0;
335. c=0;
340. q=0;
345. d201: IF a=0 THEN GO TO d203;
350. IF a<0 THEN GO TO d203;
355. c=c+a;
```
405. PUT IMAGE('TOTAL',abs(c),abs(b))(image8);
406. c=0;
407. b=0;
408. a=0;
409. PUT LIST('');
410. PUT LIST('');
411. PUT LIST('');
412. PUT LIST('');
413. END d200;
414. DO i=R TO S-1;
415. SOURCES USES';
416. PUT LIST(' YEAR',i,' to',i+1);
417. a=cash(i)-cash(i+1);
418. acct='CASH';
419. CALL d200(a,acct);
420. a=inv(i)-inv(i+1);
421. acct='INVENT';
422. CALL d200(a,acct);
423. a=ar(i)-ar(i+1);
424. acct='A/R';
425. CALL d200(a,acct);
426. a=ocaset(i)-ocaset(i+1);
427. acct='OCASSET';
428. CALL d200(a,acct);
429. a=fasset(i)-fasset(i+1);
430. acct='FASSET';
431. CALL d200(a,acct);
432. a=ar(i+1)-ar(i);
433. acct='A/P';
434. CALL d200(a,acct);
435. a=oclass(i+1)-oclass(i);
436. acct='OCLASS';
437. CALL d200(a,acct);
438. a=lllib(i+1)-lllib(i);
439. acct='LLLIB';
440. CALL d200(a,acct);
441. a=cstk(i+1)-cstk(i);
442. acct='CSTK';
443. CALL d200(a,acct);
444. a=fd(i+1)-fd(i);
445. acct='PFD';
446. CALL d200(a,acct);
447. a=retain(i+1)-retain(i);
448. acct='RETAIN';
449. CALL d200(a,acct);
450. PUT LIST('');
451. END;
452. USES';
load(dave893

?list

5.01  PUT LIST('');
5.02  PUT LIST('');
6.  DECLARE ans CHAR(3) VAR;
10. DECLARE @ball FILE INPUT ;
15. DECLARE cash(5) DEC(6);
16. DECLARE inv(5) DEC(6);
17. DECLARE ar(5) DEC(6);
18. DECLARE ocaset(5) DEC(6);
19. DECLARE fasset(5) DEC(6);
20. DECLARE ap(5) DEC(6);
21. DECLARE occlab(5) DEC(6);
22. DECLARE iilab(5) DEC(6);
23. DECLARE cstk(5) DEC(6);
24. DECLARE pfd(5) DEC(6);
25. DECLARE retain(5) DEC(6);
26. DECLARE sales(5) DEC(6);
27. DECLARE cs(5) DEC(6);
28. DECLARE tox(5) DEC(6);
29. DECLARE intexp(5) DEC(6);
30. DECLARE taxes(5) DEC(6);

157. image9? IMAGE;

163. DECLARE f(5);
164. DECLARE w(5);
165. DECLARE r(5);
167. DECLARE J(5);
180. OPEN FILE(@ball) INPUT ;
185. ;
190. READ FILE(@ball) INTO(urs);
195. READ FILE(@ball) INTO(cash);
200. READ FILE(@ball) INTO(inv);
205. READ FILE(@ball) INTO(ar);
210. READ FILE(@ball) INTO(ocaset);
220. READ FILE(@ball) INTO(fasset);
230. READ FILE(@ball) INTO(ap);
235. READ FILE(@ball) INTO(occlab);
240. READ FILE(@ball) INTO(iilab);
245. READ FILE(@ball) INTO(cstk);
250. READ FILE(@ball) INTO(pfd);
255. READ FILE(@ball) INTO(retain);
260. READ FILE(@ball) INTO(sales);
265. READ FILE(@ball) INTO(cs);
270. READ FILE(@ball) INTO(tox);
275. READ FILE(@ball) INTO(intexp);
305. READ FILE(@ball) INTO(taxes);
310.5 f=0;
311. J=0;
312. r=0;
312.5 h=0;
312.7 g=0;
313. w=0;
313.5 PUT LIST('');
314. wrspro=5;
314.1 PUT LIST('');
314.2 PUT LIST('');
a=(f(1)+f(2)+f(3)+f(4)+f(5))*yrs;
x=j(1)+j(2)+j(3)+j(4)+j(5);
DO i=1 TO yrs;
h(i)=sales(i);
END;
y=h(1)+h(2)+h(3)+h(4)+h(5);
DO i=1 TO yrs;
r(i)=j(i)**2;
END;
p=r(1)+r(2)+r(3)+r(4)+r(5);
s=(j(1)+j(2)+j(3)+j(4)+j(5))**2;
b1=(a-x*p-s);
DO i=1 TO yrs;
raw(i)=botb1*<i+1>;
END;
P=r(1)+r(2)+r(3)+r(4)+r(5);
s=(h(1)+h(2)+h(3)+h(4)+h(5))/yrs;
m=(j(1)+j(2)+j(3)+j(4)+j(5))/yrs;
bo=s-b1*m;
DO i=1 TO yrs;
bal(i)=bo+b1*<i+1>;
END;
PUT LIST('Are the Sales projections printed below from a regression of your past sales accurate?');
PUT LIST('forecast of future sales. If they are not the computer will ask for your own projections.');
PUT LIST('');
PUT LIST('Balance Sheet Projections based on Sales relationship for Years');
DO i=1 TO yrs;
t(i)=cash(i)/sales(i);
END;
t=(t(1)+t(2)+t(3)+t(4)+t(5))/yrs;
DO i=1 TO yrs;
f(i)=t*w(i);
END;
PUT IMAGE('CASH',f(1),f(2),f(3),f(4),f(5)>(image9)P
DO i=1 TO yrs;
inv(i)/sales(i);
END;
t=(t(1)+t(2)+t(3)+t(4)+t(5))/yrs;
DO i=1 TO yrs;
f(i)=t*w(i);
END;
PUT IMAGE('INVENY',f(1),f(2),f(3),f(4),f(5)>(image9)P
DO i=1 TO yrs;
r(i)=cash(i)/sales(i);
END;
t=(t(1)+t(2)+t(3)+t(4)+t(5))/yrs;
DO i=1 TO yrs;
f(i)=t*w(i);
END;
PUT IMAGE('CASH',f(1),f(2),f(3),f(4),f(5)>(image9)P
DO i=1 TO yrs;
r(i)=inv(i)/sales(i);
END;
t=(t(1)+t(2)+t(3)+t(4)+t(5))/yrs;
DO i=1 TO yrs;
f(i)=t*w(i);
END;
t=(r(1)+r(2)+r(3)+r(4)+r(5))/wrs;
DO i=1 TO wrs;
f(i)=t*w(i);
END;
PUT IMAGE('OCASSET',f(1),f(2),f(3),f(4),f(5))(imase9);
DO i=1 TO wrs;
r(i)=cash(i)+inv(i)+ar(i)+ocaset(i)/sales(i);
END;
t=(r(1)+r(2)+r(3)+r(4)+r(5))/wrs;
DO i=1 TO wrs;
f(i)=t*w(i);
END;
PUT IMAGE('TODTCA',f(1),f(2),f(3),f(4),f(5))(imase9);
DO i=1 TO wrs;
r(i)=fasset(i)/sales(i);
END;
t=(r(1)+r(2)+r(3)+r(4)+r(5))/wrs;
DO i=1 TO wrs;
f(i)=t*w(i);
END;
PUT IMAGE('TASSSET',f(1),f(2),f(3),f(4),f(5))(imase9);
DO i=1 TO wrs;
r(i)=ap(i)/sales(i);
END;
t=(r(1)+r(2)+r(3)+r(4)+r(5))/wrs;
DO i=1 TO wrs;
f(i)=t*w(i);
END;
PUT IMAGE('A/P',f(1),f(2),f(3),f(4),f(5))(imase9);
DO i=1 TO wrs;
r(i)=ocliab(i)/sales(i);
END;
t=(r(1)+r(2)+r(3)+r(4)+r(5))/wrs;
DO i=1 TO wrs;
f(i)=t*w(i);
END;
PUT IMAGE('OCLIAB',f(1),f(2),f(3),f(4),f(5))(imase9);
DO i=1 TO wrs;
r(i)=ltlib(i)/sales(i);
END;
t=(r(1)+r(2)+r(3)+r(4)+r(5))/wrs;
DO i=1 TO wrs;
f(i)=t*w(i);
END;
PUT IMAGE('TOTCT',f(1),f(2),f(3),f(4),f(5))(imase9);
DO i=1 TO wrs;
r(i)=t*w(i);
END;
PUT IMAGE('TODTCT',f(1),f(2),f(3),f(4),f(5))(imase9);
DO i=1 TO wrs;
r(i)=t*w(i);
END;
t\(=\frac{r(1)+r(2)+r(3)+r(4)+r(5)}{\text{yrs}}\); DO i=1 TO yrs;f(i)=t*w(i);END;

PUT IMAGE('CSTK',f(1),f(2),f(3),f(4),f(5))(image9);
DO i=1 TO yrs;r(i)=pf(i)/sales(i);END;
t\(=\frac{r(1)+r(2)+r(3)+r(4)+r(5)}{\text{yrs}}\);

DO i=1 TO yrs;f(i)=t*w(i);END;

PUT IMAGE('PFD',f(1),f(2),f(3),f(4),f(5))(image9);
DO i=1 TO yrs;r(i)=retain(i)/sales(i);END;
t\(=\frac{r(1)+r(2)+r(3)+r(4)+r(5)}{\text{yrs}}\);

DO i=1 TO yrs;f(i)=t*w(i);END;

PUT IMAGE('RETAIL',f(1),f(2),f(3),f(4),f(5))(image9);
DO i=1 TO yrs;r(i)=cost(i)+cl(i)+lib(i)+cstk(i)+pf(i)+retain(i)/sales(i);END;
t\(=\frac{r(1)+r(2)+r(3)+r(4)+r(5)}{\text{yrs}}\);

DO i=1 TO yrs;f(i)=t*w(i);END;

PUT IMAGE('T NW/L',f(1),f(2),f(3),f(4),f(5))(image9);
PUT LIST('');

END Dave85;
DECLARE @bal1 FILE INPUT;
DECLARE cash(5) DEC(6);
DECLARE inv(5) DEC(6);
DECLARE ar(5) DEC(6);
DECLARE ocaset(5) DEC(6);
DECLARE fasset(5) DEC(6);
DECLARE ocset(5) DEC(6);
DECLARE itlib(5) DEC(6);
DECLARE cstk(5) DEC(6);
DECLARE Pfd(5) DEC(6);
DECLARE retain(5) DEC(6);
DECLARE sales(5) DEC(6);
DECLARE css(5) DEC(6);
DECLARE tox(5) DEC(6);
DECLARE intexp(5) DEC(6);
DECLARE taxes(5) DEC(6);

READ FILE(@bal1) INTO(wrs);
READ FILE(@bal1) INTO(cash);
READ FILE(@bal1) INTO(inv);
READ FILE(@bal1) INTO(ar);
READ FILE(@bal1) INTO(ocaset);
READ FILE(@bal1) INTO(fasset);
READ FILE(@bal1) INTO(ap);
READ FILE(@bal1) INTO(ocliab);
READ FILE(@bal1) INTO(itlib);
READ FILE(@bal1) INTO(cstk);
READ FILE(@bal1) INTO(rfd);
READ FILE(@bal1) INTO(retain);
READ FILE(@bal1) INTO(sales);
READ FILE(@bal1) INTO(css);
READ FILE(@bal1) INTO(tox);
READ FILE(@bal1) INTO(intexp);
READ FILE(@bal1) INTO(taxes);

f=0;
J=0;
DO i=1 TO wrs;
J(i)=i+1-
END;

DECLARE n(5);

DO i=1 TO wrs;

DECLARE n(5);
r(i)=J(i)**2;
END;
p=r(1)+r(2)+r(3)+r(4)+r(5);
s=(J(1)+J(2)+J(3)+J(4)+J(5))**2;
b=(y-s)**y/ys**2;
g=(n(1)+n(2)+n(4)+n(5))/yrs;
m=(J(1)+J(2)+J(3)+J(4)+J(5))/yrs;
b0=y-b1**m;
DO i=1 TO 5;
w(i)=b0*b1*(i*yrs);
END;
PUT LIST('Presented below are the growth patterns of your Total Assets and Net Worth. If they are not correct');
PUT LIST('the computer will ask for your own projection.');
PUT LIST('');
PUT LIST('Balance Sheet Projections based on a Total Asset and Total NW+liability relationship for the Years');
PUT LIST('');
J=0;
DO i=1 TO yrs;
J(i)=cash(i)/n(i);
END;
t=(J(1)+J(2)+J(3)+J(4)+J(5))/yrs;
DO i=1 TO 5;
f(i)=t*w(i);
END;
PUT IMAGE('CASH',f(1),f(2),f(3),f(4),f(5))(image2);
DO i=1 TO yrs;
J(i)=inv(i)/n(i);
END;
t=(J(1)+J(2)+J(3)+J(4)+J(5))/yrs;
DO i=1 TO 5;
f(i)=t*w(i);
END;
PUT IMAGE('INV',f(1),f(2),f(3),f(4),f(5))(image2);
DO i=1 TO yrs;
J(i)=ar(i)/n(i);
END;
t=(J(1)+J(2)+J(3)+J(4)+J(5))/yrs;
DO i=1 TO 5;
f(i)=t*w(i);
END;
PUT IMAGE('A/R',f(1),f(2),f(3),f(4),f(5))(image2);
DO i=1 TO yrs;
END;

\[ t = (J(1) + J(2) + J(3) + J(4) + J(5))/\text{irs}; \]
DO i=1 TO 5;
  f(i) = t * w(i);
END;

PUT IMAGE('TOTCA', f(1), f(2), f(3), f(4), f(5)) (image2); DO i=1 TO 5;
  J(i) = fasset(i) / n(i);
END;

\[ t = (J(1) + J(2) + J(3) + J(4) + J(5))/\text{irs}; \]
DO i=1 TO 5;
  f(i) = t * w(i);
END;

PUT IMAGE('FASSET', f(1), f(2), f(3), f(4), f(5)) (image2);

PUT IMAGE('TOTASS', w(1), w(2), w(3), w(4), w(5)) (image2);

\[ i = 1 \text{ TO } \text{irs}; \]
\[ J(i) = \text{aP}(i)/n(i); \]

\[ t = (J(1) + J(2) + J(3) + J(4) + J(5))/\text{irs}; \]
DO i=1 TO 5;
  f(i) = t * w(i);
END;

PUT IMAGE('A/P', f(1), f(2), f(3), f(4), f(5)) (image2);

\[ i = 1 \text{ TO } \text{irs}; \]
\[ J(i) = \text{oClIaB}(i)/n(i); \]

\[ t = (J(1) + J(2) + J(3) + J(4) + J(5))/\text{irs}; \]
DO i=1 TO 5;
  f(i) = t * w(i);
END;

PUT IMAGE('OCLIAB', f(1), f(2), f(3), f(4), f(5)) (image2);

\[ i = 1 \text{ TO } \text{irs}; \]
\[ J(i) = \text{aP}(i) + \text{oClIaB}(i)/n(i); \]

\[ t = (J(1) + J(2) + J(3) + J(4) + J(5))/\text{irs}; \]
DO i=1 TO 5;
  f(i) = t * w(i);
END;

PUT IMAGE('TOTCT', f(1), f(2), f(3), f(4), f(5)) (image2);

\[ i = 1 \text{ TO } \text{irs}; \]
\[ J(i) = \text{clTlIaB}(i)/n(i); \]

\[ t = (J(1) + J(2) + J(3) + J(4) + J(5))/\text{irs}; \]
DO i=1 TO 5;
  f(i) = t * w(i);
END;

PUT IMAGE('CSTK', f(1), f(2), f(3), f(4), f(5)) (image2);

\[ i = 1 \text{ TO } \text{irs}; \]
\[ J(i) = \text{cSTK}(i)/n(i); \]

\[ t = (J(1) + J(2) + J(3) + J(4) + J(5))/\text{irs}; \]
DO i=1 TO 5;
  f(i) = t * w(i);
END;

PUT IMAGE('CSTK', f(1), f(2), f(3), f(4), f(5)) (image2);
DO i=1 TO 5;
f(i)=t*w(i);
END;
PUT IMAGE('PFD',f(1),f(2),f(3),f(4),f(5))(image2);
DO i=1 TO yrs;
J(i)=retain(i)/n(i);
END;
t=(J(1)+J(2)+J(3)+J(4)+J(5))/yrs;
DO i=1 TO 5;
f(i)=t*w(i);
END;
PUT IMAGE('RETAI',f(1),f(2),f(3),f(4),f(5))(image2);
PUT IMAGE('T NW/L',w(1),w(2),w(3),w(4),w(5))(image2);
PUT LIST('');
PUT LIST('');
END Dave87;

DECLARE inv(5) DEC(6);
DECLARE ar(5) DEC(6);
DECLARE ocase(5) DEC(6);
DECLARE fasset(5) DEC(6);
DECLARE ap(5) DEC(6);
DECLARE oclib(5) DEC(6);
DECLARE llib(5) DEC(6);
DECLARE cst(5) DEC(6);
DECLARE Pfd(5) DEC(6);
DECLARE retain(5) DEC(6);
DECLARE sales(5) DEC(6);
DECLARE ds(5) DEC(6);
DECLARE tax(5) DEC(6);
DECLARE intexp(5) DEC(6);
DECLARE taxes(5) DEC(6);
DECLARE v(5) DEC(6);

DECLARE imase9: IMAGE;

DECLARE boat:

DECLARE f(5) DEC(6);
DECLARE w(5) DEC(6);
DECLARE r(5) DEC(6);
DECLARE j(5) DEC(6);
DECLARE ai(10) DEC(6);
ai=0;
DECLARE p(10) DEC(6);
p=0;
DECLARE c(10) DEC(6);

READ FILE@bal1) INTO(ans);
IF upcase(ans)='YES' THEN GO TO sar;
IF upcase(ans)='NO' THEN GO TO car; ELSE GO TO boat;
put list('');
J(i)=i+1-1;
END;
DECLARE h(5) DEC(6);
DO i=1 TO wrs;
f(i)=J(i)*sales(i);
END;
a=(f(1)+f(2)+f(3)+f(4)+f(5))*wrs;
x=J(1)+J(2)+J(3)+J(4)+J(5);
DO i=1 TO wrs;
h(i)=sales(i);
END;
w=h(1)+h(2)+h(3)+h(4)+h(5);
DO i=1 TO wrs;
r(i)=J(i)**2;
END;
r=r(1)+r(2)+r(3)+r(4)+r(5);
s=(J(1)+J(2)+J(3)+J(4)+J(5))**2;
b1=(q-x*u)/(wrs*p-s);
s=(h(1)+h(2)+h(3)+h(4)+h(5))/wrs;
m=(J(1)+J(2)+J(3)+J(4)+J(5))/wrs;
b0=s-b1*m;
DO i=1 TO 5;
w(i)=b0+t*b1*(i*wrs);
END;
DO i=1 TO 5;
r(i)=w(i);
PUT LIST('r(i)=w(i));
PUT LIST('Enter the amount of annual debt payments due of the current long term loans for the next 5 years.);
PUT LIST(');
DO i=1 TO 5;
GET LIST(clt(i));
PUT LIST('Enter the amount of new debt requested.);
GET LIST(db);
GET LIST(pb);
DECLARE depr(5) DEC(6);
PUT LIST('Enter the approx. amount of depreciation to be taken in the next five years.);
DO i=1 TO 5;
GET LIST(depr(i));
PUT LIST('Please enter the approx. amount of depreciation to be taken in the next five years.);
END;
PUT IMAGE('SALPRO',w(1),w(2),w(3),w(4),w(5));
t = (r(1) + r(2) + r(3) + r(4) + r(5))/wrs;
DO i = 1 TO yrs;
   f(i) = t * w(i);
   END;
PUT IMAGE('MARGIN', f(1), f(2), f(3), f(4), f(5)) (image9);
DO i = 1 TO yrs;
   r(i) = tox(i)/sales(i);
   END;
t = (r(1) + r(2) + r(3) + r(4) + r(5))/wrs;
DO i = 1 TO yrs;
   f(i) = t * w(i);
   END;
PUT IMAGE('OP EXP', f(1), f(2), f(3), f(4), f(5)) (image9);
DO i = 1 TO yrs;
   r(i) = (sales(i) - css(i) - tox(i))/sales(i);
   END;
t = (r(1) + r(2) + r(3) + r(4) + r(5))/wrs;
DO i = 1 TO yrs;
   f(i) = t * w(i);
   END;
PUT IMAGE('EBIT', f(1), f(2), f(3), f(4), f(5)) (image9);
DO i = 1 TO yrs;
   r(i) = tax(i)/sales(i);
   END;
t = (r(1) + r(2) + r(3) + r(4) + r(5))/wrs;
DO i = 1 TO yrs;
   f(i) = t * w(i);
   END;
PUT IMAGE('TAXES', f(1), f(2), f(3), f(4), f(5)) (image9);
DO i = 1 TO yrs;
   r(i) = (sales(i) - css(i) - tox(i) - tax(i))/sales(i);
   END;
t = (r(1) + r(2) + r(3) + r(4) + r(5))/wrs;
DO i = 1 TO yrs;
   f(i) = t * w(i);
   END;
DO i=1 TO 5-1;
f(i+1)=r(i+1)-r(i);
END;

DO i=1 TO yrs;
J(i)=(ap(i)+ocliab(i))/sales(i);
END;

DO i=1 TO 5;
ri=t*w(i);
END;

h(1)=r(1)-ap(yrs)-ocliab(yrs);
DO i=1 TO 5;
w(i)=v(i)+depr(i)-f(i)+th(i);
END;

PUT IMAGE('CHANGE TOTTC',h(1),h(2),h(3),h(4),h(5))(image9);

DO i=1 TO 5;
r(i)=t*w(i);
END;

h(1)=r(1)-ap(yrs)-ocliab(yrs);
DO i=1 TO 5;
w(i)=v(i)+depr(i)-f(i)+th(i);
END;

PUT IMAGE('CHANGE TOTCT',h(1),h(2),h(3),h(4),h(5))(image9);

DO i=1 TO 5;
r(i)=t*w(i);
END;

h(1)=r(1)-ap(yrs)-ocliab(yrs);
DO i=1 TO 5;
w(i)=v(i)+depr(i)-f(i)+th(i);
END;

PUT IMAGE('CHANGE TOTCT',h(1),h(2),h(3),h(4),h(5))(image9);

DO i=1 TO 5;
r(i)=t*w(i);
END;

h(1)=r(1)-ap(yrs)-ocliab(yrs);
DO i=1 TO 5;
w(i)=v(i)+depr(i)-f(i)+th(i);
END;

PUT IMAGE('CHANGE TOTCT',h(1),h(2),h(3),h(4),h(5))(image9);

DO i=1 TO 5;
r(i)=t*w(i);
END;

h(1)=r(1)-ap(yrs)-ocliab(yrs);
DO i=1 TO 5;
w(i)=v(i)+depr(i)-f(i)+th(i);
END;

PUT IMAGE('CHANGE TOTCT',h(1),h(2),h(3),h(4),h(5))(image9);

DO i=1 TO 5;
r(i)=t*w(i);
END;

h(1)=r(1)-ap(yrs)-ocliab(yrs);
DO i=1 TO 5;
w(i)=v(i)+depr(i)-f(i)+th(i);
END;

PUT IMAGE('CHANGE TOTCT',h(1),h(2),h(3),h(4),h(5))(image9);

DO i=1 TO 5;
r(i)=t*w(i);
END;

h(1)=r(1)-ap(yrs)-ocliab(yrs);
DO i=1 TO 5;
w(i)=v(i)+depr(i)-f(i)+th(i);
END;

PUT IMAGE('CHANGE TOTCT',h(1),h(2),h(3),h(4),h(5))(image9);

DO i=1 TO 5;
r(i)=t*w(i);
END;

h(1)=r(1)-ap(yrs)-ocliab(yrs);
DO i=1 TO 5;
w(i)=v(i)+depr(i)-f(i)+th(i);
END;

PUT IMAGE('CHANGE TOTCT',h(1),h(2),h(3),h(4),h(5))(image9);

DO i=1 TO 5;
r(i)=t*w(i);
END;

h(1)=r(1)-ap(yrs)-ocliab(yrs);
DO i=1 TO 5;
w(i)=v(i)+depr(i)-f(i)+th(i);
END;

PUT IMAGE('CHANGE TOTCT',h(1),h(2),h(3),h(4),h(5))(image9);

DO i=1 TO 5;
r(i)=t*w(i);
END;

h(1)=r(1)-ap(yrs)-ocliab(yrs);
DO i=1 TO 5;
w(i)=v(i)+depr(i)-f(i)+th(i);
END;

PUT IMAGE('CHANGE TOTCT',h(1),h(2),h(3),h(4),h(5))(image9);

DO i=1 TO 5;
r(i)=t*w(i);
END;

h(1)=r(1)-ap(yrs)-ocliab(yrs);
DO i=1 TO 5;
w(i)=v(i)+depr(i)-f(i)+th(i);
END;

PUT IMAGE('CHANGE TOTCT',h(1),h(2),h(3),h(4),h(5))(image9);

DO i=1 TO 5;
r(i)=t*w(i);
END;

h(1)=r(1)-ap(yrs)-ocliab(yrs);
DO i=1 TO 5;
w(i)=v(i)+depr(i)-f(i)+th(i);
END;

PUT IMAGE('CHANGE TOTCT',h(1),h(2),h(3),h(4),h(5))(image9);

DO i=1 TO 5;
r(i)=t*w(i);
END;

h(1)=r(1)-ap(yrs)-ocliab(yrs);
DO i=1 TO 5;
w(i)=v(i)+depr(i)-f(i)+th(i);
END;

PUT IMAGE('CHANGE TOTCT',h(1),h(2),h(3),h(4),h(5))(image9);

DO i=1 TO 5;
r(i)=t*w(i);
END;

h(1)=r(1)-ap(yrs)-ocliab(yrs);
DO i=1 TO 5;
w(i)=v(i)+depr(i)-f(i)+th(i);
END;

PUT IMAGE('CHANGE TOTCT',h(1),h(2),h(3),h(4),h(5))(image9);

DO i=1 TO 5;
r(i)=t*w(i);
END;

h(1)=r(1)-ap(yrs)-ocliab(yrs);
DO i=1 TO 5;
w(i)=v(i)+depr(i)-f(i)+th(i);
END;

PUT IMAGE('CHANGE TOTCT',h(1),h(2),h(3),h(4),h(5))(image9);

DO i=1 TO 5;
r(i)=t*w(i);
END;

h(1)=r(1)-ap(yrs)-ocliab(yrs);
DO i=1 TO 5;
w(i)=v(i)+depr(i)-f(i)+th(i);
END;

PUT IMAGE('CHANGE TOTCT',h(1),h(2),h(3),h(4),h(5))(image9);

DO i=1 TO 5;
r(i)=t*w(i);
END;

h(1)=r(1)-ap(yrs)-ocliab(yrs);
DO i=1 TO 5;
w(i)=v(i)+depr(i)-f(i)+th(i);
END;

PUT IMAGE('CHANGE TOTCT',h(1),h(2),h(3),h(4),h(5))(image9);

DO i=1 TO 5;
r(i)=t*w(i);
END;

h(1)=r(1)-ap(yrs)-ocliab(yrs);
DO i=1 TO 5;
w(i)=v(i)+depr(i)-f(i)+th(i);
END;

PUT IMAGE('CHANGE TOTCT',h(1),h(2),h(3),h(4),h(5))(image9);

DO i=1 TO 5;
r(i)=t*w(i);
END;

h(1)=r(1)-ap(yrs)-ocliab(yrs);
DO i=1 TO 5;
w(i)=v(i)+depr(i)-f(i)+th(i);
END;

PUT IMAGE('CHANGE TOTCT',h(1),h(2),h(3),h(4),h(5))(image9);

DO i=1 TO 5;
r(i)=t*w(i);
END;

h(1)=r(1)-ap(yrs)-ocliab(yrs);
DO i=1 TO 5;
w(i)=v(i)+depr(i)-f(i)+th(i);
END;

PUT IMAGE('CHANGE TOTCT',h(1),h(2),h(3),h(4),h(5))(image9);

DO i=1 TO 5;
r(i)=t*w(i);
END;

h(1)=r(1)-ap(yrs)-ocliab(yrs);
DO i=1 TO 5;
w(i)=v(i)+depr(i)-f(i)+th(i);
END;

PUT IMAGE('CHANGE TOTCT',h(1),h(2),h(3),h(4),h(5))(image9);

DO i=1 TO 5;
r(i)=t*w(i);
END;

h(1)=r(1)-ap(yrs)-ocliab(yrs);
DO i=1 TO 5;
w(i)=v(i)+depr(i)-f(i)+th(i);
END;

PUT IMAGE('CHANGE TOTCT',h(1),h(2),h(3),h(4),h(5))(image9);

DO i=1 TO 5;
r(i)=t*w(i);
END;

h(1)=r(1)-ap(yrs)-ocliab(yrs);
DO i=1 TO 5;
w(i)=v(i)+depr(i)-f(i)+th(i);
END;

PUT IMAGE('CHANGE TOTCT',h(1),h(2),h(3),h(4),h(5))(image9);

DO i=1 TO 5;
r(i)=t*w(i);
END;
We will now perform a monthly Cash Budget. You must enter certain new data, consisting of Monthly Sales months plus the monthly sales for the last 2 months just completed, Total Operating Expenses and Other monthly outlays. These accounts will be defined below.

Monthly Sales (monsal) consists of your projected monthly sales of the next 12 month period.

Total Operating Expenses (toxe) consists of purchases of materials, salaries, labor expenses and other cash payments.

Other Monthly Expenses (otpay) consists of taxes, dividends and repayment of current debt.

Please enter the last 2 months sales first and then enter the projected sales for the next 12 month period.

DO i=1 TO 14;
GET LIST(monsal(i));
a(i)=monsal(i);
END;

Please enter the monthly Cash Operating outlays projected for the next 12 months as defined above.

DO i=1 TO 12;
GET LIST(montox(i));
END;

Enter Other monthly Cash Payments in the month to be paid.

DO i=1 TO 12;
GET LIST(otpay(i));
z(i)=otpay(i);
END;

I need to know the minimum cash balance desired.

GET LIST(mincah);

What percentage of Total Operating Expenses are allocated to material purchases?

What percentage of sales are collected in first month of sales, second month and third month?

DECLARE colec(3);
PUT IMAGE('MONTHLY SALES',a(3),a(4),a(5),a(6),a(7),a(8),a(9),a(10),a(11),a(12),a(13),a(14),a)(image2);
97.
98. DO i=1 TO 14;
99. b(i)=monsal(i)*colect(i);
100. END;
101. PUT IMAGE('FIRST MONTH',colect(1),b(3),b(4),b(5),b(6),b(7),b(8),b(9),b(10),b(11),b(12),b(13),b(14))(image3);
102. DO i=1 TO 14;
103. c(i)=monsal(i)*colect(2);
104. END;
105. PUT IMAGE('SECOND MONTH',colect(2),c(3),c(4),c(5),c(6),c(7),c(8),c(9),c(10),c(11),c(12),c(13))(image3);
106. DO i=1 TO 14;
107. d(i)=monsal(i)*colect(3);
108. END;
109. PUT IMAGE('THIRD MONTH',colect(3),d(1),d(2),d(3),d(4),d(5),d(6),d(7),d(8),d(9),d(10),d(11),d(12))(image3);
110. f=b(3)+c(2)+d(1);
111. s=b(4)+c(3)+d(2);
112. h=b(5)+c(4)+d(3);
113. e=b(6)+c(5)+d(4);
114. J=b(7)+c(6)+d(5);
115. k=b(8)+c(7)+d(6);
116. l=b(9)+c(8)+d(7);
117. m=b(10)+c(9)+d(8);
118. n=b(11)+c(10)+d(9);
119. o=b(12)+c(11)+d(10);
120. p=b(13)+c(12)+d(11);
121. a=b(14)+c(13)+d(12);
122. r=f+s+h+e+j+k+l+m+o+p+a+r
123. PUT LIST('TOTAL',f,s,h,e,J,k,l,m,n,o,P,a,r)(image2);
124.
125. DO i=1 TO 12;
126. s(i)=monto(d(i))
127. t(i)=s(i)*Purch;
128. u(i)=s(i)*Purch;
129. END;
130. pu=t(1)+t(2)+t(3)+t(4)+t(5)+t(6)+t(7)+t(8)+t(9)+t(10)+t(11)+t(12);
131. PUT IMAGE('PURCHASES',t(1),t(2),t(3),t(4),t(5),t(6),t(7),t(8),t(9),t(10),t(11),t(12),pu)(image2);
132. wr=u(1)+u(2)+u(3)+u(4)+u(5)+u(6)+u(7)+u(8)+u(9)+u(10)+u(11)+u(12);
133. PUT IMAGE('OP EXPENSES',u(1),u(2),u(3),u(4),u(5),u(6),u(7),u(8),u(9),u(10),u(11),u(12),wr)(image2);
134. Pi=z(1)+z(2)+z(3)+z(4)+z(5)+z(6)+z(7)+z(8)+z(9)+z(10)+z(11)+z(12);
135. PUT IMAGE('OTHER PAYMENTS',z(1),z(2),z(3),z(4),z(5),z(6),z(7),z(8),z(9),z(10),z(11),z(12),Pi)(image2);
136.
137. fs=f-s(1)-z(1);
138. kJ=g-s(2)-z(2);
139. ap=h-s(3)-z(3);
140. lk=e-s(4)-z(4);
141. sh=j-s(5)-z(5);
142. at=k-s(6)-z(6);
143. it=l-s(7)-z(7);
144. ok=m-s(8)-z(8);
145. wk=q-s(9)-z(9);
146. wr=r-s(10)-z(10);
147. PUT IMAGE('NET CASH GAIN(LOSS)',fs,kJ,ap,lk,sh,at,lt,ok,wk,rr,rr)(image2);
148.
149.
150.
160. PUT IMAGE('BEGINNING BALANCE', casbal, aa, bb, cc, dd, ee, ff, dd, hh, JJ, kk, ll) (image2);
162. PUT IMAGE('CUMMULATIVE CASH', aa, bb, cc, dd, ee, ff, dd, hh, JJ, kk, ll, mm) (image2);
163. v(1)=aa-mincah;
164. v(2)=bb-mincah;
165. v(3)=cc-mincah;
166. v(4)=dd-mincah;
167. v(5)=ee-mincah;
168. v(6)=ff-mincah;
169. v(7)=gg-mincah;
170. v(8)=hh-mincah;
171. v(9)=jj-mincah;
172. v(10)=kk-mincah;
173. v(11)=ll-mincah;
174. v(12)=mm-mincah;
176. PUT IMAGE('DESIRED LEVEL OF CASH', mincah, mincah, mincah, mincah, mincah, mincah, mincah, mincah, mincah, mincah, mincah, mincah);
176.1 PUT LIST('');
176.2 a=0;
177.05 DO i=1 TO 12;
177.1 a(i)=v(i)*R/12;
177.15 IF v(i)>0 THEN a(i)=0;
177.18 IF a(i)>0 THEN a(i)=0;
177.19 s(i)=v(i)+a(i);
177.2 END;
177.25 PUT IMAGE('INTEXP ON LINE OF CREDIT', a(1), a(2), a(3), a(4), a(5), a(6), a(7), a(8), a(9), a(10), a(11), a(12)) (image2);
177.9 PUT LIST('TOTAL LOANS NEEDED');
178. PUT IMAGE('OR SURPLUS', s(1), s(2), s(3), s(4), s(5), s(6), s(7), s(8), s(9), s(10), s(11), s(12)) (image2);
179. PUT LIST('');
179.05 image4: IMAGE;------------------------
179.2 pf=r-pu-pi-wr+a(1)+a(2)+a(3)+a(4)+a(5)+a(6)+a(7)+a(8)+a(9)+a(10)+a(11)+a(12);
179.3 PUT IMAGE('CASH FLOW FROM OPERATIONS', pf) (image4);
180. PUT LIST('');