AN EXPERT SYSTEM FOR BANKING APPLICATIONS

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ABSTRACT

The objective of the study is to develop an expert system for some banking applications. In the thesis, after a general introduction to expert systems, the relationships between expert systems, artificial intelligence, decision support systems, and management information systems are discussed. Next, major characteristics and classification of expert systems are presented. Database, knowledge base, working memory, inference engine, interface and development engine, which are the components of an expert system, are studied. The knowledge representation models are also described in dealing with the topic of knowledge base. The stages to be followed and the types of software to be used for developing an expert system are also explained.

The role of expert systems in banking, the banking applications suitable to be developed as an expert system are discussed. Finally an expert system for a chosen banking

application is constructed using an expert system shell named Personal Consultant Plus. A quite extensive reference list is given at the end. Program listing and frames are given as Appendix.

Keywords: Artificial intelligence, banking applications, decision support system, expert system, expert system development, expert system development tools, expert systems in banking, financial statement, financial statement analysis, financial strength, financial structure, information system, knowledge representation, management information system, problem representation, problem solving strategies, ratio analysis.

BANKACILIK UYGULAMALARI İÇİN BİR UZMAN SİSTEM

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ÖZET

Bu çalışmanın amacı bazı bankacılık uygulamaları için bir uzman sistem geliştirmektir. Çalışmada uzman sistemlere genel bir giriş bölümünden sonra, uzman sistemlerin yapay us, karar destek sistemleri ve yönetim bilgi sistemleri ile ilişkileri tartışılmıştır. Daha sonra uzman sistemlerin başlıca özellikleri tanıtılmış ve sınıflandırılmaları yapılmıştır. Veri tabanı, bilgi tabanı, çalışma alanı, çıkarım makinası, arabirim ve geliştirme makinası gibi uzman sistem öğeleri açıklanmıştır. Ayrıca bilgi gösterim modelleri, bilgi tabanı konusu açıklanırken tanıtılmıştır. Uzman sistem geliştirme sırasında izlenecek aşamalar ve kullanılabilecek yazılım çeşitleri de tezde ayrıca anlatılmıştır.

Uzman sistemlerin bankacılıktaki rolü ve uzman sistem olarak geliştirilmesi uygun olan bankacılık uygulamaları da tartışılmıştır. Son olarak, seçilen bir bankacılık uygulaması için Personal Consultant Plus adlı bir paket kullanılarak bir

uzman sistem geliştirilmiştir. Oldukça uzun bir kaynakça tezin sonunda verilmiştir. Ayrıca, program listesi ve çerçeveler Ek olarak sunulmuştur.

Anahtar Kelimeler: Bankacılık uygulamaları, bankacılıkta uzman sistemler, bilgi gösterimi, bilgi sistemi, karar destek sistemi, mali güç, mali tablo, mali tablo analizi, mali yapı, oranlar analizi, problem çözüm yolları, problem gösterimi, uzman sistem, uzman sistem geliştirme araçları, uzman sistem geliştirilmesi, yapay us, yönetim bilgi sistemi.

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I. INTRODUCTION

1.1 Statement of the Problem

Over the past several decades, society has had a great effort with trying to breath life or intelligence into machines. Nobody no longer wants to use computers that just add, subtract, multiply or divide. They have to act and think as human. The rapid developments in the field of computing brought good news about that idea. A computer can have the ability to learn, or understand from experience, it can have the ability to acquire and retain knowledge, it can respond quickly and succesfully to new questions, it can solve problems, and most important of all, it can direct a human.

In the recent years the concept of Artificial Intelligence (AI) arises from the question "Can a computer think or solve a problem as a human?". As researchers started to explore this new subject, a new branch of AI developed that combined knowledge representation with problem solving techniques. This field is known as Knowledge Based Expert Systems or just simply Expert Systems. As it is understood from its name, it is a computer system that acts as an expert. Thus, Expert Systems represent a new opportunity in computing.

1.2 Definition

To understand expert systems, one has to first clerify who is an expert and the characteristics of him. Human experts are people who know a great deal about some special subject. They also have a high degree of skill on that subjects. Their characteristics are : Solving simple problems easily, explaining what they do, they have the ability to judge the reliability of their own conclusions, they know when they are stumped, they communicate smoothly with other experts, they can learn from experience, they change their points of view to suit a problem, they transfer knowledge from one domain to another, they reason on many levels such as using tools, mathematical models, and detailed simulations.

An expert system is a computer program that behaves like a human expert. If such a system is to function like a human expert, it must be able to do things that human experts commonly do. These systems must also have the characteristics of a human expert.

Expert systems are knowledge intensive programs. They have a great amount of knowledge about their expertise, for solving a particular problem, again in the area of their speciality. The area of expert systems captures and applies a human expert's knowledge to specialized tasks ranging

from mass spectrographic analysis to financial planning [AKTAŞ and TOLUN 1988]. The way that they use for solving problems is combining their knowledge with problem-solving algorithms. They not only process and use conventional mathematical and boolean operators but also incorporate typical human reasoning techniques such as rules of thumb and shortcuts for solving problems. The purpose of any expert system is to duplicate the ability and knowledge of experts in the field of interest, and also, to mimic an expert's thought processes in solving a problem. Expert systems have the capacity to manipulate problem statements and integrate relevant pieces of knowledge from a knowledge base using reasoning techniques, known as heuristics in AI, to emulate the expert.

Expert systems are software systems, that acquire knowledge, experiences and skills of an expert, then mimic his/her thought processes, for solving problems in the field of interest. They are able to store and manipulate knowledge in order to provide a high level decision tool for the user [HART 1988].

As a result expert systems are capable of identifying dynamic solutions to problems previously capable of being solved only by the experts themselves. The procedures and reasoning invoked by these systems mirror experts, because quite simply, they are based on rules and guidelines provided

by the experts.

According to Deborah D. Wolfgram "Knowledge is power. Those who can interpret a tremendous amount of knowledge have the potential to hold a tremendous amount of power. Expert Systems provide a vehicle to harness this knowledge" [WOLFGRAM et al. 1987].

1.3 Available Work

In 1965 researchers at Stanford University began work on the grandfather of all expert systems, Dendral. Dendral, based on an algorithm developed by Nobel-Prize winner Joshua Lederberg. He designed to analyze information from a spectroscopic analysis on chemical compounds to determine their molecular structures. It was programmed in Lisp and is a good example of rule-based systems, storing much of its knowledge in "if-then" production rule statements. In 1970 Cadauceus was developed at the University of Pittsburgh to aid physicians in the diagnosis of human internal diseases. Macsyma was written in the late 1960s as a part of project Max (the original name of MIT's laboratuary of computer science). By 1971 it was succesfully employed in symbolic mathematical analysis [WOLFGRAM et al. 1987].

Mycin was developed at Stanford University in 1972. It is one of the popular and famous expert system. It was used to

assist with diagnosis and treatment of infectious blood diseases. Based on production rules, its knowledge base currently has approximately 400 rules [WINSTON 1987/A]. From Mycin stemmed Tieresias in 1976, also from Stanford University. It was a knowledge acquisition tool that assists with entering and updating the Mycin knowledge base. In 1978 the development tool Emycin evolved from Mycin. Emycin contains all of the logical structure of Mycin, exception of its knowledge of infectious blood diseases, as a result the name Empty Mycin. After these Puff came, a diagnostic consultation expert system for pulmonary function diseases. About the same time, the Stanford Research Institute (SRI) constructed the Prospector expert system. It is a rule based system that assists with the analysis of information related with geology. In 1980, Xcon developed by Digital Equipment Corporation, became the first expert system to be used in a commercial environment. Xcon performs the difficult job of configuring a customer's request for a VAX computer system [FRENZEL 1987]. In the recent years many applications of expert systems have been performed in the area of banking and finance. Invest is an expert system for financial investments [HEUER et al. 1988]. Loan Risk Advisor is another expert system for the evaluation of credit risks to small and medium sized enterprises. It was developed by Horowitz [HOROWITZ 1985]. Lending Advisor, which is one of the most popular expert systems in the area of banking, was developed by Wells

Fargo Bank and First Wachovia Bank [WOLFGRAM et al. 1987]. Another example for the banking environment is LMR (Loan Monitoring and Review) which was developed in Turkey by Bugüner. Loan monitoring and review is a banking function, and an expert system was developed as a personal DSS for the use of loan monitoring and review manager [BUGÜNER 1989].

A group of previous M.S. theses are also on the subject of expert systems. Some of them are as follows: Knowledge Representation Methods and Structures [EL-HAMED 1988], An Expert System for View Definition and Integration [CİVELEK 1988], A Generalized Expert System for Database Design [YÜRÜTEN 1986], An Expert System for Classification of Students as Successful or Unsuccessful [ÖZCAN 1989], Knowledge Based Expert Systems [SARRAFZADEH 1987], A Rule-Based Expert System for Cartridge Disk Drive Repair [HASHISH 1988], and An Expert System for Cuneiform Interpretation [GÜRSEL 1988].

Parallel with the growth of expert systems, the expert system tools are developed. They are designed to make the complicated task of building expert systems easier. Rosie, developed by the Rand corporation provides a general purpose developing environment based on production rules and was the first system designed for supporting a wide range of expert system applications. Ops, Hearsay-II, Rll and Age are

good examples of expert system tools [WOLFGRAM et al. 1987].

1.4 Artificial Intelligence and Expert Systems

People have always been fascinated by the prospect of intelligent artefacts. Wolfgang von Kempelen's chess playing automaton for many years astonished and puzzled 18th century Europe. It was later proved a fraud: it hide, with the aid of ingenious mechanical skills, a human player. Of course, in those days the technology did not exist to make an intelligent machine. Even at the beginning of this century, when Carel Capek wrote about his robot and the term how to use an intelligent machine was still considered as a dream. But with the arrival of computers after the second world war, man-made intelligence became reliable [SELL 1985]. In 1950 Alan Turing published his paper "Can a machine think?" showing by this action that it was a legitimate subject. Alan Turing argued that a general purpose machine would have many different uses. Reflecting his knowledge, the accomplishments of formal logic in the years before the war, Turing argued that the fundamental instructions given to such a machine must be based on logical operators such as and, or, not. One could use these operators to assemble the more specialized numerical operators needed for arithmetic calculations. Moreover programs based on logical operators would be capable

of manipulating any type of symbolic material that one might work with, including statements in ordinary language. The idea arises the subject that computers were not only built for numerical operations but also they have the ability to manipulate non-numerical symbols [HART 1988].

Seeing how readily computers could be used to solve problems that were too tedious for humans, speculation began whether they could also be used to solve problems that humans found too difficult. This speculation gave way to experiments, and after another six years the first AI programs appeared. In a few years programs playing chess, checkers, proving theorems of logic and geometry, solving integrals, learning concepts, performing tasks that up till could only be performed by humans. AI, the interdisciplinary subfield of computer science was born.

Simply stated, AI is computerized intelligence. AI systems are computer systems which attempt to duplicate the human thinking process [BRANDI 1988]. The AI researchers are concerned with developing computer systems that produce results that one would normally associate with human intelligence. The primary goal of AI is to make machines smarter. The secondary goal of AI is to understand what intelligence is and to make machines more useful. AI research in its infancy years in the sixties was primarily directed towards diagnostics. In the seventies a major breakthrough in

AI technology occured, when researchers realized that it was not the systematic set of rules and relationships that made computer useful in making conclusions and decisions, also it was the ability of the computer to amass the knowledge of experts in an organized fashion. This realization gives way to the expert systems which is one of the branch of AI industry. Artificial intelligence demonstrated tremendous potential in the development of expert systems [AKTAŞ and TOLUN 1988].

Other branches of AI include robotics, natural language understanding, speech recognition, voice synthesis, learning, common sense reasoning, supercomputing hardware and software, cognitive modelling, automatic programming, visualization systems, and symbolic processing computers [WINSTON 1987/B].

1.5 Conventional Programming Languages and Expert Systems

Conventional programming techniques have been used to create the large data processing systems we commonly associate with computers. These systems are capable of collecting and processing large volumes of data. They process this data by complex algorithms which are step by step procedures that reach the right conclusion when the correct data was given. Conventional programs behave in ways that only programmers understand.

Expert systems are quite different. They are highly interactive. A user can halt the processing at any time and ask why a particular line of questioning is being pursued or how a particular conclusion was reached. The main differences between an expert system and a conventional program can be listed as follows [WOLFGRAM et al. 1987]:

. The task performed by an expert system was previously performed by a human expert.
. Knowledge engineers and experts maintain knowledge systems. Conventional programs are created by programmers.
. The knowledge base of an expert system is readable and easy to modify.
. Conventional programs tend to rely on algorithms to provide their overall structure, whereas knowledge systems tend to rely on heuristics.
. Expert system developers interact with human experts to help them describe their knowledge and inference strategies. Then they implement a prototype, small system with a few facts and rules, they soon turned to the human expert to ask more questions for implementing a second version of the system. As seen the human expert is a member of the project team. However conventional programmers begin by working with an expert to develop a design. They specify the design in great detail and leave the expert. Then he develops the program alone. Programmers can spend

so much time away from the experts because their initial design dictates the entire programming effort.

1.6 Decision Support Systems and Expert Systems

In DSS (Decision Support Systems) the emphasis is on decision making at all levels of management in an organization. DSS is a tool to help managers in their decision making activities by providing them with the necessary information. The information produced by a DSS consists of interactive reports and unstructured reports generated by the individual manager [AKTAŞ 1987].

The main differences between an expert system and DSS can be listed as follows :

. ESs interest with a specific area of expertise. DSSs involve general and managerial areas.
. ESs use heuristic reasoning, symbolic manipulation, prediction and inference, certainity factors. They also remember information, produce multiple solutions by search intensive strategies. They are recursive in nature. However DSSs use mechanistic reasoning, numeric and alphabetic manipulation, what-if scenarios, truths or falseness. They never remember information, produce a single solution by computation intensive methodologies. They are iterative in nature.

. Uncertain and incomplete data, dynamic and static variables are the data characteristics of expert systems. Exact and factual data, static variables are the data characteristics of DSSs.
. Expert systems use natural language dialogue and generate reviews and summaries for the user interface. However DSSs operate on menu command interface. The user interface of expert systems are quantitative and qualitative, but the user interface of DSSs are quantitative only.
. Expert systems are developed and maintained by the expert or knowledge engineer. DSSs are developed and maintained by the user.

1.7 Management Information Systems and Expert Systems

The information system of an organization may be defined as a system that serves to provide information within the organization when and where it is needed at any managerial level. Management Information System is a subsytem of the information system which is relevant to managerial decisions for control and strategic planning purposes [AKTAŞ 1987]. The main purpose of MIS is to support the organizational and managerial decisions of an organization. MIS is a collection of subsystems. The subsystems that are involved in the structure of the MIS are Decision Support Systems, Expert Systems, Office Automation Systems and End-user Computing

Systems [AKTAŞ 1989].

Expert systems are not stand-alone systems. They are usually linked together with other expert systems, decision support systems, office automation systems and others, to form a complex and sophisticated integrated system or a management information system that controls the activities of an organization as a whole.

The life cycle of an expert system (stages of expert system development), is similar to the information system life cycle [AKTAŞ 1987]. The only difference is that the systems analyst develops the information system whereas the knowledge engineer constructs the expert system.

1.8 Commercially Available Expert Systems and Examples

There are a lot of expert systems reported to be in use today, and their number is rapidly increasing. Finding examples to analyze is not difficult, but there are three systems that have a great importance, they are explained first and then two other expert systems from the banking industry and financial investment will be overlooked. Finally a number of expert systems will be listed according to their field of interest.

DENDRAL: Its aim is to hypothesise on the possible molecular

structure of a compound. Originally Dendral was designed to enumerate all possible configurations of a set of atoms observing the rules of chemical valence. This enumeration could then serve as a checklist of possibilities for the chemist. It is a family of programs. But the original algorithm is at the center of this family. The others extent its power. Dendral takes a generated set of possible cases and reduces them to a set of likely ones. For doing that it stores and uses heuristics or rules based on chemical facts, on the laws of chemistry, and on the judgement of experts. Dendral's inventors developed a companion system, Meta-dendral which is designed to assist chemists in amending dendral's knowledge base. It proposes and selects fragmentation rules for organic structures, testing and modifying rules and using knowledge about the problem [HART 1988].

MYCIN: If we look closely at a physician's task, we can see that he has four decisions to make: does the patient suffer from bacterial infection, what organism is responsible, which drugs will be sufficient, and which of these to administer. Mycin was designed to assist to all these decisions. It is a very famous system which attempts to diagnose blood infections and recommend treatments and it acts in the following way. It collects the data and test results of the patient. It arrives a conclusion for all four questions. It

displays these conclusions and its degree of certainity about them. It can then display, on request, the path of reasoning it followed to reach its conclusions. Work started on Mycin in 1972 in Stanford University. Its name is derived from "streptomycin". The rules that it uses were obtained from specialists in the field of bacterial infection [HART 1988].

PROSPECTOR: It is a computer based consulting system designed to aid geologists in their search for ore deposits and in their evaluation of the mineral potential of large geographic areas. It was developed in Stanford Research Institute. Like Mycin, it is a conversational system based on rules obtained from specialists [SELL 1985].

LENDING ADVISOR: Commercial banks are examining ways to protect from considerable pressure on profits due to loan losses. Loan management is a serious part of banking system, because the real profit of banks depend on that. The expert system called as lending advisor was developed by Syntelligence company [WOLFGRAM et al. 1987].

INVEST: It is an expert system developed to help make financial decisions. It dialogues with bank officials. Invest obtains information about a customer's wishes and attempts to make useful and well founded investment proposals. It covers the entire spectrum of possible investments [HEUER et al. 1988].

A list of expert system applications across various industries are given below. These systems are either in use or in the prototyping stages of development. The names enclosed in parantheses show the expert systems available for those applications [WOLFGRAM et al. 1987].

Advertising:

. Media buying

Aerospace:

. Diagnosis of airplane engines

. Helicopter repair

. Navigator for reentry control (Navex)

. Spacecraft malfunction diagnosis

Agriculture:

. Control of disease in winter wheat crops (Wheat Counsellor)

. Management of apple orchards (Pomme)

. Rice disease diagnosis

Chemical:

. Chemical synthesis planning (Synchem)

. Disease of metals

. Structure elucidation (Dendral)

. Welding material selector (Weldselector)

Computers and Communications:

. Analyze VMS dump files in system crash (Cdx)

. Analyze telephone switching systems (Compass)

. Check order entry (Conad)

. Computer configuration (Xcon, Xsel, Xsite)

. Database management system selection

. Diagnose circuit fabrication lines (Pies)

. Diagnosing failures in disk drive (Faultfinder)

. Diagnosing failures in tape drives (AI-Spear)

. Hardware diagnosing interpretation (Doc)

. Managing resources for chip designers (Callisto)

. Monitoring MVS operating system (Yes/MVS)

. Software job costing (Cocomo 1)

. Troubleshooting Ethernet networks (Ntc)

. Troubleshooting telephone lines (Ace)

. Troubleshooting communication hardware (Bds)

Drilling:

. Analysis of oil well logging datas (Dipmeter Advisor)

. Diagnosing drilling problems (Mudman)

Education:

. Debugging pascal programs

. Student behaviour consultant

. Technical engineering education

. Test result interpreter

. Textbook selection advisor

Engineering:

. Carburetor fault diagnosis

. Construction project planning and evaluation

. Design of motor components

. Linear programming system

. Symbolic integral calculus (Macsyma)

Environment:

. Mineral deposit relationships (Prospector)

. Weather forecasting

Financial Services:

. Analysis of risk insurance (Underwriting Advisor)

. Assess commercial insurance risk

. Brokerage legislation

. Conflict-of-interest consultant

. Credit approval (Lending Advisor)

. Electronic banking services

. Financial analysis

. Financial planning advisor (Planpower)

. Financial statement analysis

. Foreign exchange rates

. Loan application assistant

. Staff loan scheme

. Stock broker marketing advice

. Tax advisor

. Investment analysis (Invest)

Management:

. Analyze battlefield intelligence (Trw)

. Business productivity tool (Guru)

. Creating documents (Document Modeler)

. Process management and information services (Mod 300)

Medical:

. Cancer management (Onococin)

. Diagnosis of pulmonary diseases (Puff)

. Diagnosis of infecious diseases (Mycin)

. Medical expert (Cadauceus)

Ordering Systems and Marketing:

. Order checking (Ocean)

. Promotion of goods (Promoter)

Scheduling:

. Production management system (Isis)

. Scheduling manufacturing orders (Isa)

1.9 Objectives and Scope of the Study

The major objective of this study is to analyze expert systems in general and to develop an expert system for a banking application.

In this first chapter, after a general definition, expert systems are compared to artificial intelligence, conventional

programming languages, decision support systems and management information systems. The commercially available expert systems are also stated by giving some examples.

In Chapter two, the major characteristics and the classification of expert systems are explained. The major components of an expert system are stated. Then, problem representation and problem solving strategies are basicly described. At the end of this chapter, the stages within the life cycle of expert system development are given with the software considerations.

In the third chapter, the suitable banking subjects are determined by analyzing the available applications in this field and the role of expert systems in banking environment is stated.

In Chapter four, an expert system for the chosen banking application is developed by using an expert system development tool.

Finally, chapter five includes summary and conclusions about the study, and it is followed by the list of references used throughout the thesis.

II. EXPERT SYSTEMS

2.1 Major Characteristics

Expert systems display essential and desirable characteristics: essential ones, without which they could not be called expert systems and desirable ones without which, in most cases, they would not be usable.

Essential Characteristic : Artificial intelligence has two different products, one of them is models of human cognition and the other intelligent artefacts [BRANDI 1988]. Expert Systems belong to the latter. They were created to model how experts set about solving problems and, as a result, to understand better the workings of an expert's mind. The main purpose of creation is getting benefits from the expert thought embedded in a computer system. Of course, these two areas interact with beneficial side-effects. Building Expert Systems is in a sense creating a model of expert thought, and this allows us to cast better models of cognition [SLATTER 1987].

Intelligent artefacts are produced primarily to solve problems, and this is the main reason for building expert systems. The two main methods of problem solving used by intelligent artefacts, namely general or domain-independent and special or domain-specific, expert systems come into the

second, domain-specific category. A large class of these domain-specific methods relies on knowledge obtained from human experts. They are known as knowledge based systems or sometimes intelligent knowledge based systems (KBS and IKBS). Expert systems, in fact, form a subclass of knowledge based systems, a subclass that focuses on a single area, which restricts itself to a single domain of expertise.

If the system is not knowledge based it should not be called as an expert system. The main difficulty with this injunction is how to differentiate knowledge based systems from others. For that reason we have to identify practically what is knowledge: any rules, facts, truths, reasons and heuristics gleaned from experts that have been found useful in the domain of solving problems [SELL 1985].

The domain in which an expert system operates is a particular domain. Individual expert systems are employed to diagnose blood diseases, to monitor iron-lung patients, and to advise mineral explorers; each is a well-defined and sharply differentiated area of expertise. MYCIN can say nothing about cancer, PROSPECTOR nothing about oil, even though these topics are closely related with the areas of these systems [WOLFGRAM et al. 1987].

Furthermore, expert systems domains are areas of expertise, in contrast to common sense; expert systems

typically possess very little common sense. DART I a machine diagnostics system will never tell you to stop testing because the equipment is on fire. Some view that as a serious shortcoming. Nevertheless expert systems solve enough tough problems succesfully to be useful even without common sense.

If their area of expertise is narrow, so is their focus. Expert sytems plug away at one problem at a time. They ask questions of their users or obtain input from sensors and proceed from the data to some sort of conclusion. In one sense, an expert system is just one big transformation system, and the templates that its knowledge is expressed in are just rules of transformation. But the power of an expert system lies precisely in these rules. In order to do its job, an expert system needs to perform relatively few numerical calculations but a lot of symbolic processing. Symbolic processing implies that facts, observations and hyphotheses are represented and manipulated as symbols. In other words the expert system does not know in any sense what these symbols mean or stand for. Nevertheless, by these rules of transformation it is able to convert its input to some conclusion.

Desirable Characteristics : Expert sytems must possess, in most cases other characteristics if they are to be usable [SELL 1985].

1- First of all an expert system must perform well on difficult problems. Ordinary performance would render it unreliable and performance restricted to easy problems would render it unemployable. But while the requirement is sensible,we must not take it to an extreme: it is not reasonable to expect better performance from an expert system than from an expert. If our system does out-perform experts, that is an added bonus, not a rightful expectation. Of course we can expect full functionality and availabilty for 24 hours of a day from our expert system, it never gets tired. But we cannot rightfully expect that all its answers will always be correct, even less to demand a proof of their correctness. When we employ a human expert, we are given no such guarantees or proofs. If the expert does not perform well enough, we hire another; if the expert system does not perform well enough, we improve it.

2- The second practical requirement is that the system must be implementable. It is obvious that the domain of an expert system is sharply focused. The reason for this is that at the moment the knowledge of even such a narrow domain requires a lot of effort to get hold of, to get into a working state, and to get right. Research is currently being conducted in this most important area of AI applications, in other words in the area of knowledge

acquisition. We have to keep the domain narrow enough to be implementable, yet wide enough to be useful.

3- The third requirement stems from the fact that expert systems interact with human beings: they ask questions, they deliver conclusions, they produce advice. To do this effectively the system must converse in terms that the user can understand and in terms relevant to the problem at hand.

4- The next requirement is that expert systems must be able to explain themselves, particularly in three respects. First of all and most important, a system must be able to explain how it reached its conclusions from the facts given. If it cannot, there is no way to deal with conclusions that the user disagrees with. If it can, however, the explanation allows the user either to correct his own judgement of the case, or to reject that of the system; at least he is given enough information to do one or the other sensibly. The second and sometimes equally important requirement, of the system to be able to justify why it needs a particular piece of information. Given such a facility, the user can judge the merit of each case and decide accordingly. The third requirement in this area is not an absolute one, but can be extremely useful. This is an ability on the part of the system to explain why it has not reached a particular conclusion,

why it has not made a particular recommendation. This sort of explanation can sometimes be more illuminating than any other output.

5- Another important practical requirement is that these systems should work at the speed that the situation demands. This implies conversational pace for systems that talk to humans, real-time pace for systems that talk to other systems. If a developer wishes to see his system in real use, he must be sure that it works at a speed fast enough for the problem and comfortable to its user.

There are also requirements placed on how the knowledge base should be implemented. Expert systems, like works of art, are never finished, merely abandoned promptly if there is no easy way to modify and augment their knowledge base. Both our knowledge of a subject and our expectations of a system grow and change. If we cannot accomodate this growth and change, we end up with a oldfashioned, fossilisied product [SELL 1985].

With respect to the methods of inference employed, there are two requirements. The first is that they should work. The second is that enough methods of inference should be provided to allow expert rules to be expressed in a natural way.

Most of these practical requirements - implementability, modifiability, response time, decent interface are not unique

to expert systems; they are all sound software engineering principles. The outstanding special requirement is for an explanation facility. Because of its importance, it may be thought as an essential rather than just a desirable qualification.

2.2 Classification of Expert Systems

There are several ways to classify expert systems. The first and most obvious way is by their area of application. The most famous area is of course medicine, systems like MYCIN, INTERNIST, VM, PUFF, CASSNET, KMS and MDX, all adressed medical specialities. Chemistry and geology lead the field in other scientific areas (DENDRAL, SECS for chemistry, PROSPECTOR for geology) [ANDRIOLE 1985]. The popular area of the last decade is financial investment. It is also an interesting area of application for expert systems (INVEST) [HEUER et al. 1988].

Another interesting, and perhaps more meaningful way of classifying expert systems is by the tasks that they are called upon to perform. Some are called upon to analyse data and interpret its meaning. Others asked to diagnose the reasons for or sources of disparity between expected and actual states or operations of a system. Some have as their main task to predict the next state or action of a system on

the basis of data from its current state, specifically to give warning of impending malfunction. There is also another useful task: teaching. Expert systems embody knowledge of their domain; this knowledge can be used to train new experts.

2.3 Major Components

The six basic components of an expert system are the Database, the Knowledge Base, the Working Memory, the Inference Engine, the Interface and the Development Engine, as seen in Fig. 2.1 [WOLFGRAM et al. 1987].

2.3.1 Database

This includes the facts of the problem, both related and unrelated. This is a passive area of the expert system, simply a storage space for data and formulas. The information included encompasses the given and unchanging knowledge about the problem and domain of interest. For example, this area might contain formulas for integral calculus or the data of customers of a branch of a bank.

2.3.2 Knowledge Base

Before defining the knowledge base of an expert system

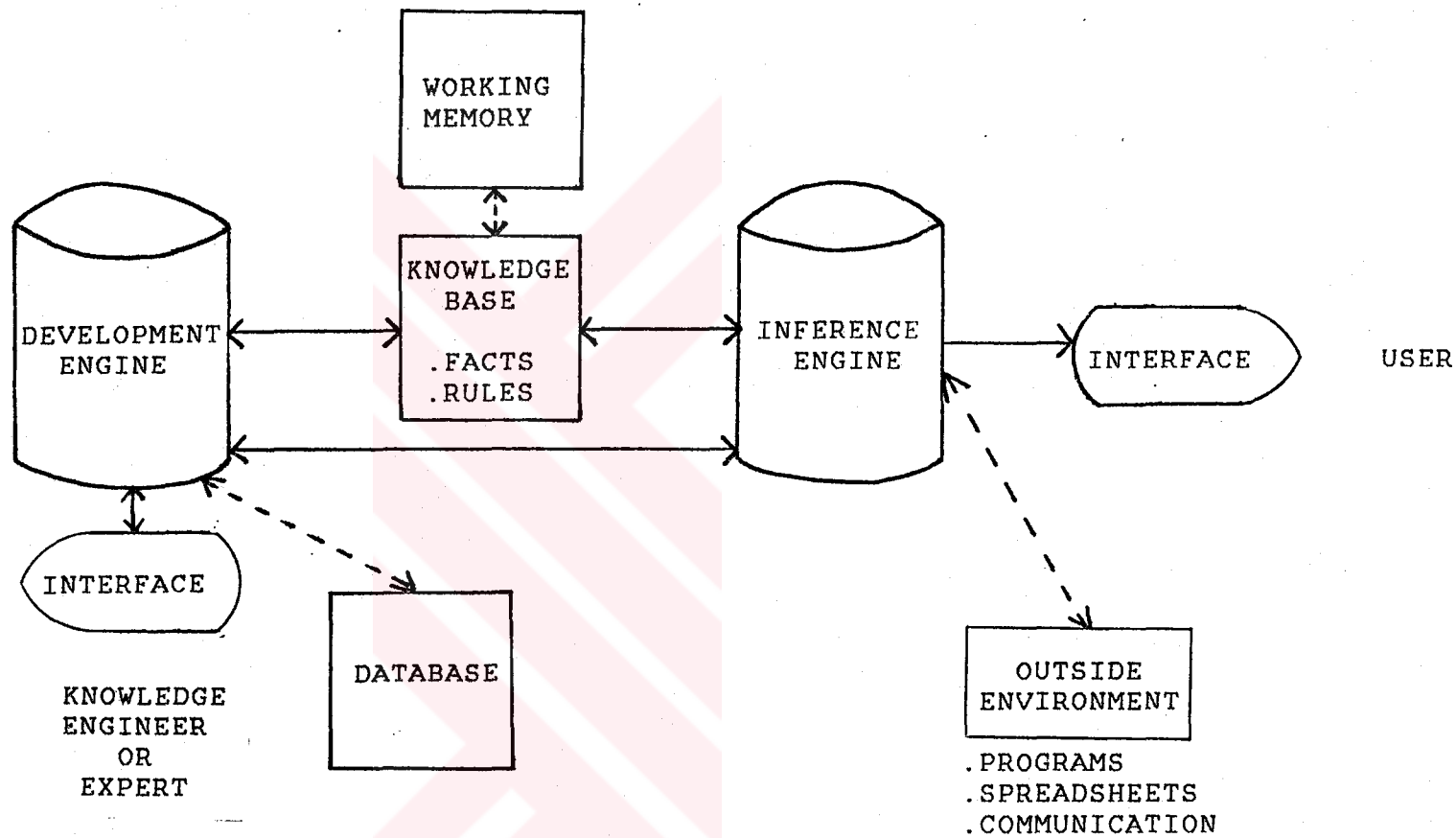


Figure 2.1 Basic Components of an Expert System

one has to give the definition of the term knowledge by comparing it to data and information. Data, information and knowledge form a hierarchy where data is on the bottom and knowledge is at the top according to their meaning value [AKTAŞ 1987]. Knowledge is the basis for human decision making. When the computer does data processing the human must convert the data into information upon which he does knowledge processing to arrive at a decision. When the computer does information processing which includes data processing, the human must supply only knowledge processing to arrive at a decision. When the computer does knowledge processing which includes data and information processing, there is very little left for the human to do except to apply the results to the specific task [SIEGEL 1986].

The knowledge base of an expert system includes the related and unrelated relationships of the data of the problem and domain. Production rules, the basis of most expert systems, are located here. The knowledge base contains the information and expertise for an application. The more complete the knowledge in the knowledge base, the more powerful the expert system [WOLFGRAM et al. 1987].

The importance of this level, then, is not only the completeness of the knowledge, but the method by which the knowledge is represented.

Knowledge representation models describe the various architectures used to represent the expert's knowledge in an organized and consistent manner. The most popular models are defined as follows [EL-HAMED 1988]:

a. Semantic Networks

b. Frames

c. Production Rules

d. Neural Networks

e. Predicate Calculus

Each knowledge representation model has its advantages and disadvantages. Microcomputers commonly use production rules, primarily for ease of understanding and implementation. The remaining models, typically more complex, are currently seen more often on minicomputers and mainframes. The objective is to select the knowledge representation model that most closely covers the requirements of the expert system to be developed. The selection of the knowledge representation model closest to the expert's world lends itself to easier encoding of the knowledge. In addition, debugging and testing the expert system will not be so difficult with a knowledge representation model that fits the expert's view of interest. For this reason, selection of knowledge representation models are important considerations when evaluating the application and selecting appropriate expert system software.

There are some algorithms for converting a knowledge

representation model to another, for example conversion of frames to production rules or vice versa [THURAISINGHAM 1989].

In the following sections, models are reviewed briefly.

a - Semantic Networks

A semantic network shows relationships among various entities. Semantic networks are the most general representational structure and serve as the basis for other knowledge representations. Semantic networks, alone, are never directly used to model the knowledge. A semantic network is a collection of objects (nodes), that are linked together by a relationship. Nodes not only represent objects, but concepts and situations as well, and they are shown graphically by dots, circles, or boxes as shown in Fig. 2.2 [WATERMAN 1986]. Relationships between objects are expressed as arcs or links and are represented graphically by an arrow between the two nodes for which the relationship is intended to be expressed [DUDA and GASCHNIG 1985].

Flexibility is the major advantage of semantic networks through the ability to add, modify, or delete new nodes and arcs where appropriate. One of the disadvantages of semantic networks is that there is no formal representation structure. No standart rules exist by which to define unique nodes or relationships.

Sentence: "Bill told Laura that he gave Judy a gift"

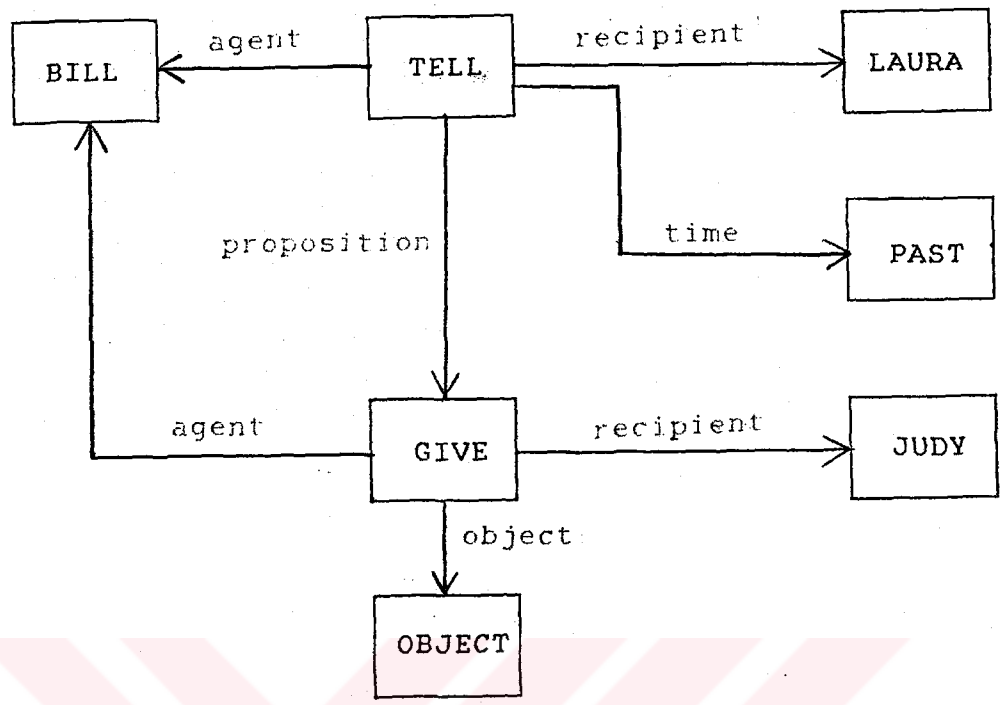


Figure 2.2 A Semantic Net Representation of an English Sentence

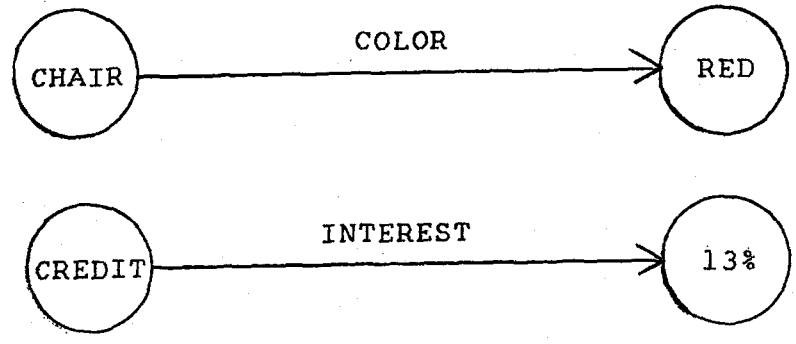


Figure 2.3 O-A-V (Object-Attribute-Value) Representation Examples

Several varities of semantic networks exist, but one most commonly used in expert systems is the Object-Attribute-Value (O-A-V) . Objects are physical or conceptual entities and are represented graphically as nodes. Attributes are the general properties or objects and are designated by arcs or links. Values are also represented by nodes and are the specific quantity or description of an attribute for an object as shown in Fig. 2.3 [WOLFGRAM et al. 1987].

b - Frames

Another method for representing knowledge is the frame. A frame is a data structure which represents an entity type. Frames, as in frames of reference, consist of collection of slots that contain attributes to describe an object, a class of objects, a situation, an action, or an event. Frames provide a concise, structural represantation of useful relations that capture the way an expert typically thinks about the data in the knowledge base. Frames are the elaboration of semantic networks. Frames differ from semantic networks according to the concept of frame which is a single unit that groups all the values. Frames encompass entire situations, complex objects, or a series of events in one unit, instead of using several O-A-V triplets. Frames are indexes that refer knowledge, assumptions, what things to look for, and in what ways to look for them in a predefined representation. If a frame is not applicable to a

given situation, control will move to another frame. The frame tree of the expert system, which is implemented in this study, is in Fig. 4.3 in Chapter 4. A frame example is given in Fig. 2.4 [SIEGEL 1986].

The primary advantage of frame representation is that the more concise and compact the knowledge base, the shorter the amount of time required for searching a specific information. The major advantages of frames over semantic networks are that frames may be used for partitioning a complex domain and for storing procedures in addition to descriptive data [SIEGEL 1986].

MAMMAL FRAME		CARNIVORE FRAME		BIRD FRAME	
A-KIND-OF	: ANIMAL	A-KIND-OF	: ANIMAL	A-KIND-OF	: ANIMAL
SKIN COVER	: HAIR	APPEARANCE	: FORWARD EYES, POINTED TEETH	SKIN COVER	: FEATHERS
ACTIVITY	: PRODUCES MILK	ACTIVITIES	: EATS MEAT	ACTIVITIES	: FLYS LAYS EGGS
PARENT FRAME	: ANIMAL FRAME	PARENT FRAME	: ANIMAL FRAME	PARENT FRAME	: ANIMAL FRAME

Figure 2.4 Frame Representation Examples

c - Production Rules

Production rules are conditional if-then and if-then-else descriptions of a given situation or context of a problem. The if clause describes an object, situation, or position. If the if clause is true the then clause of the production rule is activated. If the production rule contains else clause and the if clause is false, the else clause of the production rule is activated. The if clause is called the premise; the then and else clauses are called the action. It is not necessary to use an else clause. The format is as follows:

IF [premise(s)] THEN [action(s)] ELSE [action(s)]

A rule is said to be activated when all of the conditions in the premise of a rule are satisfied by the current situation. The production rule is said to be fired or executed when the action is performed. Also the logical operators (AND,OR) are used to logically combine different premises. The basic advantage of production rules is the ease of use in comparision with the other models. The systems that use production rules for representing the knowledge are called as production systems or rule-based systems. Their general structure consists of three parts: A rule base composed of a set of production rules, a context data structure, an inference engine that controls the system's activity.

The advantages of rule based systems are : They are modular; which means individual production rules can be added deleted or changed independently of their relationship to other rules. They are uniform; They are natural; production rules are structured similarly to the way people think about solving a problem.

The disadvantages are : They are rigid; uniformity can introduce a rigid structure that makes it difficult to follow the flow of control in problem solving. Rule-based systems don't reason at multiple levels. They are inefficient; production rules introduce inefficiency in execution. Every action must go through the match-action cycle in the context data structure, making it difficult to efficiently execute predetermined situational sequences [HARMON and KING 1985].

d - Neural Networks

Neural-net based expert systems form a new direction in conventional expert systems. Neural networks provide a suitable environment to implement an expert system, and also provide some interesting properties over the other approaches in buliding expert systems. Neural networks provide a rich environment for parallelism. The neural-net based knowledge can be parallelised by considering each neural cell as a processor by itself. Neural networks facilitate the ability of learning, also they facilitate representations for certain type of problems such as recognition [SHAAR and TOLUN 1989].

e - Predicate Calculus

Predicate calculus or logic programming, relies on the truth and rules of inferences to represent symbols and their relationships to each other. For example, If A Then B, and A exists, allow us to conclude B. This provides a simple way of determining the truth or falsity of a statement. Predicate calculus is actually an extension of propositional logic. The form of logic most often used is first order predicate logic, which is an extension of predicate calculus.

First order predicate logic works with variables, predicates, sentential connectives, qualifiers and functions. Variables represent objects, things and statements in question. Predicates describe a relationship or make a statement about the varible under consideration.
The most commonly used sentential connectives are:

and	: $\wedge$ or &
or	: $\vee$
not	: ! or $\neg$
implies	: ->
equivalent	: $\equiv$

Sentential connectives add more complexity because the truth or falsity of a complex statement is a combination of its individual statements analyzed by the rules stored in a truth table [WOLFGRAM et al. 1987].

The following is an example for predicate calculus for the mammal frame given in Fig. 2.4.

A-KIND-OF(X,ANIMAL) & SKIN-COVER(X,HAIR) &
ACTIVITY(X,PRODUCES MILK) -> TYPE(X,MAMMAL)

The major advantages are : Preciseness and modularity.
The primary disadvantage is that if the number of facts in the knowledge base increases, the number of ways to combine them is more difficult [WOLFGRAM et al. 1987].

2.3.3 Working Memory

Working memory simply takes data from the database, knowledge from the knowledge base and combines them with the information supplied from the user that will be processed by the inference engine to result a solution. It is only invoked when the expert system is in operation. It is sometimes considered as a part of the knowledge base because it holds the dynamic or executing part of the knowledge, the static unchanging part of the knowledge remains in the knowledge base. Knowledge that is dynamic and changes from case to case is stored in the working memory. Each knowledge representation model uses working memory in its point of view. Frames in working memory are called as slots. Predicate calculus uses working memory for theorem proving.

2.3.4 Inference Engine

The inference engine is the workhorse of the expert system. It consists of processes that activates the knowledge base, do analyses from hyphotheses and audit the processes according to some strategy that emulates the expert's reasoning [WOLFGRAM et al. 1987].

The inference engine operates on the new information obtained from the user or the developer, combines it with the knowledge base, considers the relationships in the knowledge base and then solve the problem in the working memory using its reasoning or search strategies. It is the thinker of a problem solving system.

The inference engine must know where to start solving a problem and be able to resolve any conflicts that might arise during the problem-solving process. The technique used by the computer to reason or search for an answer will depend on the type of application and knowledge representation model. In order to understand the role of the inference engine in an expert system we have to clarify how a problem is represented and how it is solved. Problem representation and problem solving strategies will be explained in Sections 2.4 and 2.5.

2.3.5 Interface

A lot of interfaces are used in the creation and operation of an expert system. Interfaces include a terminal, graphical representations, multiple character windows, and multiple graphic windows. These interfaces have importance in three situations. First situation is where the user is a client, he wants answers to problems. The second case is where the user acts as a tutor to enhance the expert system. Here the user is primarily the knowledge engineer, who wants to improve or increase the knowledge of the expert system. The third situation is where the user acts as a pupil of the expert system. In this case he wants to harvest the knowledge base [SIEGEL 1986].

2.3.6 Development Engine

A development engine or a knowledge acquisition subsystem, is vital in the creation of an expert system. It allows the knowledge engineer to create, modify, add or delete information from the knowledge base.

The strength and power of an expert system lie in the knowledge base. They are successful if they are rich in knowledge, even they have inefficient problem solving algorithms. This knowledge is largely heuristic, judgemental,

experimental, and uncertain. Expert systems are complex programs to construct and maintain but their return offer tremendous problem solving power and efficiency[SIEGEL 1986].

2.4 Problem Representation

Expert systems generally use two popular models in problem representation, namely state-space representation and problem-reduction representation [WOLFGRAM et al. 1987].

2.4.1 State-Space Representation

States are snapshots of varying conditions in an environment at one moment in time. They are unique. Operators act on a state to transform it to another state. A state-space represents all reachable states (including the goal state) for a given problem. In a state-space there is an initial condition state. The operators are first applied to that state to obtain the other states. The aim is to reach to the goal state which is the solution of the problem. State-space reresentation is inefficient for complex programs.

2.4.2 Problem Reduction Representation

Problem reduction representation starts with a problem statement. Then this problem statement is broken into

subproblems. Repeatedly, the subproblems are broken until a solution is immediate, in other words no further subproblem is necessary. Problem reduction representation consists of : The initial problem statement, a set of operators that transform the problem into a set of subproblems, and primitive problem statements that are solvable immediately. The best illustration of problem reduction representations are AND/OR graphs. AND/OR graphs are defined accordingly. Primitive problem statements are considered terminal nodes. Each node is a set or a single problem statement. A node with several branches and a connecting arc between the branches is an AND branch, and all nodes must be solvable. An AND node is a node which is attached to an AND branch. A node with several branches and no connecting arc between each branch is an OR branch (where the problem is solved by any branch node). An OR node is a node which is attached to an OR branch. Finally nodes can be shared. Problem reduction representation is an efficient method for complex problems.

2.5 Problem Solving Strategies

The problem is described in a representation model, now, the computer needs a strategy to solve the problem. Searching is the key for solving a problem. Searching involves choosing a path through the knowledge base to find a solution. If the path is unsuccesful, alternative paths are tried in search

for a solution. The goal in problem solving is to find the best search technique which locates a solution path efficiently and effectively by limiting the number of paths examined. Problem solving can be catagorized as search methods and control strategies. In the following two sections the search methods and control strategies will be defined briefly [WOLFGRAM et al. 1987].

2.5.1 Search Methods

Searches can be divided into two categories as blind and heuristic searches.

Blind searches are sometimes called as weak searches, that means no intelligent decision making, in other words, using no heuristics in searching process. Blind searches are used when the solution path, which is one of the paths from the initial state to the goal state, is arbitrary. That means for reaching the goal state no domain specific information is needed. Blind searches are very costly if a large state-space have to be examined. Exhaustive, Breadth-First, Depth-First are examples of blind searches [WOLFGRAM et al. 1987].

Heuristic searches are referred to as strong searches. Heuristics are rules of thumb which are believed to work reasonably well. They are usually not proven, but learnt from

experience and work adequately [HART 1988]. Heuristic searches involve the analysis of domain specific information, which is not reside in the state-space or operators of it. The advantage of domain specific information is reducing the size of the state-space for searching. This domain specific information is used to identify which node to search next, determine which successors to generate next, and finally, mark the nodes (paths) as NOT to search due to some heuristic criterion which states that these nodes (paths) will not satisfy the goal. Hill-Climbing, Best-First, Branch-and-Bound A*, Generate-and-Test are some examples of heuristic searches [WOLFGRAM et al. 1987].

2.5.2 Control Strategies

Once the search method is selected, different situations require different reasoning strategies (control strategies) for deciding what to do next, namely deciding which operation to apply and where to apply it. Some control strategies are Forward Chaining, Backward Chaining, Bidirectional, Means-End and Least Commitment. These are not methods to examine a state-space or AND/OR graph. They are only reasoning strategies (for example determining the initial and goal states), to search a graph by a search method. In order to clerify the control strategies, the most popular types are defined as follows:

a) Forward Chaining: In this strategy the search starts with the initial conditions and continues forward through the knowledge base towards a solution. The system begins with a fact and proceeds to search for a rule whose premise is verified by that fact. It is very useful in what-if scenarios [KELLER 1987].

b) Backward Chaining: It is the opposite of forward chaining. Backward chaining is a goal directed search that starts at the end solution (goal state) and works backward towards the initial conditions. The task is to see whether the necessary and sufficient predecessors that satisfy the goal exist in the domain by applying the inverse operations. The process begins with a goal-state hypothesis, next the system seeks to find a rule whose premise supports the hypothesis and then attempts to verify the premise by searching the knowledge base for a relevant fact. If no fact is found, the system searches for a rule that can be used instead of that fact. This process of searching and verifying the supporting facts continues until the original hypothesis is verified or disproved [KELLER 1987].

c) Bidirectional: Bidirectional reasoning involves going both forward and backward through the domain during a session. At the beginning of the process, the inference engine begins at one end and proceeds either forward or backward. As inference engine traverses through the knowledge base, at each node it

has the choice of proceeding forward or backward. The decision of going forward or backward is made by a predefined rule [WOLFGRAM et al. 1987].

2.6 Stages of Expert System Development

The stages of expert system development is as follows [WOLFGRAM et al. 1987].

1. Identification and Definition of the Problem
2. Development of the Prototype
3. Construction (Development of a Complete Expert System)
4. Testing and Evaluation
5. Integration and Implementation
6. Maintenance

In the following section the phases of expert systems development will be explained.

2.6.1 Identification and Definition of the Problem

This stage includes the identification and determination of the scope of the problem and its characteristics. Choosing the right problem is the most critical part of the entire development effort. This stage includes the the consideration of the expert(s) required, the resources needed (money, hardware, software, development

time), and the goals of the expert system. It is also important to decide whether the problem can actually be addressed by an expert system. These considerations provide an initial guide for direction in the development of the expert system prototype, which is the next phase.

2.6.2 Development of the Prototype

The prototype system is a small version of the expert system designed to test the assumptions about how to encode the facts, relationships, rules and inference strategies of the expert. In the prototype the reasoning processes of the expert must be identified. This is known as knowledge discovery. Selecting the appropriate expert system building tool is also included in this phase. Expert system building tools are defined in the Section 2.7.

Once the prototype is in place, it is a working model or submodel, of the planned complete expert system. In that stage, a decision is made whether to continue the project or and construct the complete expert system or abandon the operation [WOLFGRAM et al. 1987].

2.6.3 Construction

In this stage the detailed rules that operate the

knowledge are formulated, and refined by combining and reorganizing the knowledge from the prototype. This stage also includes the primary knowledge obtaining process, formally called knowledge acquisition. Knowledge base is expanded and the front and end user interfaces are carefully designed. The front interface deals with the input, modification and maintenance of the information in the knowledge base. The end interface deals with the user and how the system will run (such as menu driven), finally what features will be available to the user (direct help facility, review of the reasoning of the system).

2.6.4 Testing and Evaluation

In this phase the system should be tested against the performance criteria that were agreed upon the conclusion of the prototyping phase. This is also the time when other experts are invited to try the system, and to present it with new cases. Any modifications required for correction are completed here. After these modifications the system have to be tested again. This continuous loop (testing-modification-testing) continues until all testing is complete, at the point where the expert system is ready for use [SIEGEL 1986].

2.6.5 Integration and Implementation

In this stage the system is integrated into the day-to-day operations of the organization. This includes education, training, and operational procedure changes. Basicly this step includes integration of the expert system into the work environment in which it will operate and providing training for those who will use and maintain the system [HARMON and KING 1985].

2.6.6 Maintenance

The developments of expert systems are never complete, due to dynamic environment of information. The ability of expert systems are continuously updated with new rules and heuristics. The maintenance process involves, the continual process of reviewing, modifying, expanding, and upgrading the knowledge base, updating the system due to the developments in software and hardware.

2.7 Software Considerations in Expert System Development

Currently, expert system software falls into three categories:

a- General Purpose AI Languages

b- Development Tools (Shells)

c- Prepackaged Commercial Expert Systems

In the following sections they will be briefly discussed.

2.7.1 General Purpose AI Languages

Every expert system is developed using some type of programming language. Since expert systems are evolved from AI, they commonly employed from a general purpose AI language. The most common AI languages are LISP and PROLOG. Sometimes expert systems are developed from general purpose non-AI languages such as Pascal, C too.

Lisp is a high-level, functional, symbol processing language. The major characteristics of Lisp are [FROST 1986]:

- Lisp supports dynamic data structures.
- Lisp is more flexible than most other high-level languages.
- Lisp is oriented towards symbollic processing.
- Lisp has a concise and precisely defined semantics.

One of the primary reasons Lisp is so popular is because a symbolic program is naturally represented in Lisp data structures. Programs and data have the same form and thus can be treated somewhat interchangeably, allowing Lisp users to write programs capable of running and modifying other programs. This permits an expert system program to make

changes to lines of its own code while running. Other specialized features of Lisp are: powerful debugging facilities, the availability of both a compiler and an interpreter for program development, run-time checking, garbage collection, a macro facility for easy extensions of the language. There are two main families of Lisp. One of them is MACLISP. The descentants of Maclisp include Zetalisp, Common Lisp and Franzlisp. The other main family is the INTERLISP. Variations of Interlisp are T-Lisp, N-Lisp, Lisp/Vm, Iqlisp and Gclisp [CHADWICK and HANNAH 1987].

In order to express the knowledge base in a form suitable for input to the computer, it is necessary to translate these facts and rules into a programming language. The majority of existing programming languages are, however, designed to deal with character or numeric data. Prolog provides the user with a total environment consisting of facilities for the rapid development of expert systems by expressing the facts and rules, knowledge base, in the forms of patterns [SMITH 1988].

Prolog stands for PROgramming in LOGic. The basis of Prolog is the notion of logic programming in which computation can be viewed as controlled, logical inferences. Prolog is a language suitable for applications requiring the simulation of intelligence. The suitable application areas of Prolog are: Expert systems, language processing, robotic control and planning systems. It is not an algorithmic

language like Cobol or Pascal, but based on the concepts of formal logic (predicate calculus). Prolog is a pattern-matching system that allows the user to specify variables. Prolog backtracks to try to match the requested patterns, and continues to backtrack until the problem is solved. Prolog like Lisp has some derivations, such as Mprolog, Lm-Prolog, C-Prolog, Quintus Prolog, and Turbo Prolog [CHADWICK and HANNAH 1987].

Some other special AI languages are Conniver, Flavors, Logo, Planner, Sail, and Smalltalk [FRENZEL 1987].

2.7.2 Development Tools (Shells)

A development tool is a program or collection of programs that facilitates the creation of other software [FRENZEL 1987]. During the past several years, a lot of development tools are designed to assist the knowledge engineer in building expert systems. Several companies have introduced tools with various functions, standarts, and features. Expert system tools are skeleton expert systems. Also known as shells. They are comprised of :

- A predefined inference engine that knows how to use the knowledge base to reach conclusions
- A knowledge base development engine (editor) for constructing and editing the knowledge base

- Knowledge integrity checks to weed out contradictory facts, rules, redundant or missing information, and syntactical errors
- A spelling checker to make sure words are typed correctly
- An on-line logic reasoning base for explaining how and why a conclusion is reached
- Performance monitoring tools for testing and debugging the expert system during development; this enables the knowledge engineer to set trace and break point conditions based on the knowledge base versus a location counter in the program
- A graphics/windowing package for ease of interactive use to illustrate information and relationships, allowing knowledge engineers to switch from one environment to another without losing the context
- Integration with traditional software tools such as word processors, spreadsheets, and communication programs

Future development tools may include:

- Simulation kits (offering the knowledge engineer the ability to test all aspects of an expert system)
- Text generation and explanation packages (which provide the ability to input data from textbooks for knowledge acquisition)
- Sound generation and voice recognition packages (used for knowledge acqisition and end user interfaces)

- Sophisticated natural language front ends (to simulate carrying on a conversation with a human expert directly)

The advantage of using a development tool is that the knowledge engineering acquisition tools and utilities have already been built. The knowledge engineer or expert system developer does not consume time for creating the reasoning and data structure components. Development tools reduce the time spent creating the prototype and allow more time to test and debug the prototype. In addition a development tool usually provides numereous peripheral utilities that have been developed to support a large system. This gives the expert system developer more power for manipulating the knowledge base and inference engine. The disadvantage of using a development tools is that it will generally use only one reasoning technique, knowledge representation model, while complex applications require a combination of techniques and models. However, some recent tools can manipulate both forward, backward chaining and bidirectional. Some examples of expert system shells are as follows: ADVISOR, ADS, AL/X, CxPERT, DAISY, DUCK, Easy, ESE/MVS, ESI, ES/P, Expert Ease, Expert-2, EST, EXSYS, FLOPS 1.2, HPRL, IKE, INSIGHT, KDS, KES II, KNOWOL, LOOPS, Micro-PS, NEXPERT, OPS5+, OPS/83, Personal Consultant Plus, PICON, REVAL, RuleMaster, SeRIES, TIMM, TOPSI, Turbo Expert, TWAICE, VP-Expert, XSYS [FRENZEL 1987].

2.7.3 Prepackaged Commercial Expert Systems

The last type of the software to be used in expert systems development is prepackaged (canned) expert systems. Prepackaged expert systems come complete with an expert's knowledge and problem-solving heuristics already embodied in the system. No development or knowledge acquisition time is required. Most of the existing expert systems were developed by large corporations. Recently, however demands by small to medium size companies who want the benefits of expert systems, but can not afford a full-development staff, have created the market for prepackaged expert systems. Many of the prepackaged expert systems are in the financial service, insurance underwriting, and medical industries. The most popular prepackaged expert systems are: LENDING ADVISOR, COCOMO 1, SKIPPER, EXPERLISP [WOLFGRAM et al. 1987].

III. EXPERT SYSTEMS IN BANKING

3.1 The Demand for Expert Systems in Banking

After the computerization of some banking applications that depend on data and information processing such as deposit banking and accounting management, the banks are closely interested in the areas which will be suitable for AI technology in the recent years. Banks see expert systems as a technology which will be of great use to them. There are two main reasons for this attitude[GUILFOYLE and JEFFCOATE 1988]:

. the service-based nature of banking
. changes in the financial markets, bringing increased opportunities and competition

Banks are service industries, where the quality of service may be the main differentiating factor between competitors. They suffer from shortages of skilled staff, in certain areas and from training problems. These characteristics predispose banks to expert systems techniques, which allow them to make better use of specialized knowledge. The factors that attracted the bank managers towards expert systems are as follows:

. improved use of existing skills
. enhancements to the functionality of data and

information processing systems

. intelligent interfaces

. better use of vast quantities of data stored already

The banking industry have rapidly become more competitive, nationally and internationally. Banks have to improve their performance to their customers. The growing size and complexity of financial markets mean that some tasks such as keeping track of loans are difficult without improved and more flexible computer support. Banking is a service industry directly based on staff skills. Expert systems offer a way of extending these skills.

In a competitive environment such as banking, preserving expertise within an organization is important. It is not always easy to find top level experts who have scarce abilities in the area of their expertise. When such an expert leaves the bank, the traditional solution is to train an apprentice. However, the abilities of this expert can be retained in an expert system. An expert system has the benefit of supporting this apprentice and training him.

Banks also feel that they can capitalize on their investment in advanced technology to open up new market areas. They need to be one step ahead of the competition and believe that expert systems technology will give them that advantage [GUILFOYLE and JEFFCOATE 1988].

Banks are examining ways to prevent from loan losses that make a negative pressure on their profits. The strategies that will be followed for preventing these losses are as follows: a systematic risk analysis, a powerful industry analysis and a detailed financial statement analysis. The effects of these factors will be more powerful and reliable if they are obtained from an expert system.

3.2 Application Areas of Expert Systems in Banking

The suitable fields for developing an expert system in banking can be listed as follows [GUILFOYLE and JEFFCOATE 1988]:

- product advisors
- financial planing
- credit assessment
- customer loan advisors
- investment advisors
- loan risk assessment
- portfolio management
- financial statement analysis
- business performance evaluation
- market information monitors
- foreign exchange advisors

Although the above application areas are suitable for

expert systems development, in other words some prototypes are generated, in a few cases these systems are operational [GUILFOYLE and JEFFCOATE 1988]. The current areas of activity may be summarized as follows.

a- Product Advisors

The main purpose of product advisory system is to assist the bank's staff in marketting financial products and services. They are relevant to retail financial services including the retailing of brokerage and other financial services, and are purely a front office activity.

The advantages of product advisors are as follows:

- providing a consistent level of information for the customer
- covering the full range of products on offer in detail
- promoting a particular product
- matching the customer's needs to a suitable range of products
- providing training for the bank's staff

b- Financial Planning

They are the systems which offer advice to individuals on how to manage their financial affairs. Portfolio management, investment advisors are other application areas that can be involved in financial planning.

The main advantages are:

. bringing service to clients on financial planning

. improve the service offered, because financial planning includes several fields like cash flow management, investment advice, portfolio management.

c- Credit Assessment

Systems which are in some way related to decisions about credit form one of the most active area for the application of expert systems. The growth in the demand for credit has led to increase the number and variety of credit types. Personal (consumer) loans, bank overdraft credits, mortgages, corporate loans, business (commercial) credits, public sector credits, cash letter of credits, credit cards, and revolving credits are some examples of credit types. The most obvious application of expert systems technology in this area is to the assessment of the initial application for credit, whether from an individual or from a company, applicant's current financial status, previous credit history, external credit references, the amount and the purpose of the loan, the acceptance of the market. Assessing the risk involved, evaluating assets offered for security, management qualification of the firm, recovering from bad debts, auditing the performance of loan officers are the closely related topics with credit assessment. The other application areas that are used together with credit assessment are

loan risk assessment, market information monitoring, business performance evaluation, financial statement analysis and customer loan advisors.

IV. AN APPLICATION

4.1 Identification and Definition of the Problem

The general area under study is developing an expert system for a selected banking application. Many areas of banking lend themselves to expert system development as explained in Chapter III.

Today, all of the banks offer a wide variety of services, including deposits, credits, foreign exchange, brokerage, securities and insurance. The importace of banking is the management of liquidity. Among these, the credit services have a great role in increasing the profit of a bank, in other words an effective credit service in a bank provides a powerful management of liquidity [HOROWITZ 1985].

Banks lend to many types of borrowers, for varying periods, on many bases and for a variety of reasons. Loans, therefore, will vary in liquidity and risk. The idea behind credit management is to lend as much as possible without forgetting the risk behind it. The evaluation of risk of a loan is the most important part of the credit services. A well-documented and carefully evaluated risk assessment, have a significant impact on a bank's financial health. The risk of a loan is the result of a process called as credit analysis or loan screening.

The loan screening or credit analysis process begins upon receipt by the credit department of the bank. The loan application normally contains the amount of money requested, the purpose of the loan, financial statement (balance and income sheets), and information related with the applicant. The application is assigned to a lending officer to perform credit analysis. Before doing the detailed credit analysis, the lending officer prescreens the application as shown in Fig. 4.1, and determines whether the application is suitable for detailed credit analysis. This process involves considering if the type and amount of credit is applicable for detailed credit analysis. Also, in the prescreening process the legal constraints and the conformity of the purpose of credit against the credit policy of the bank are evaluated. The legal constraints are obtained from credit information department and central bank's dishonoured checks, protested bills reports. The presence of legal constraints (such as, protested bills or dishonoured checks), or opposition to the credit policy of the bank, cause the loan application to be directly rejected.

The detailed credit analysis entails gathering information through personal interviews, on-site visits and document examination. The analysis includes reviews and evaluations of [MOCKLER 1989]:

. information gathered on the applicant company's

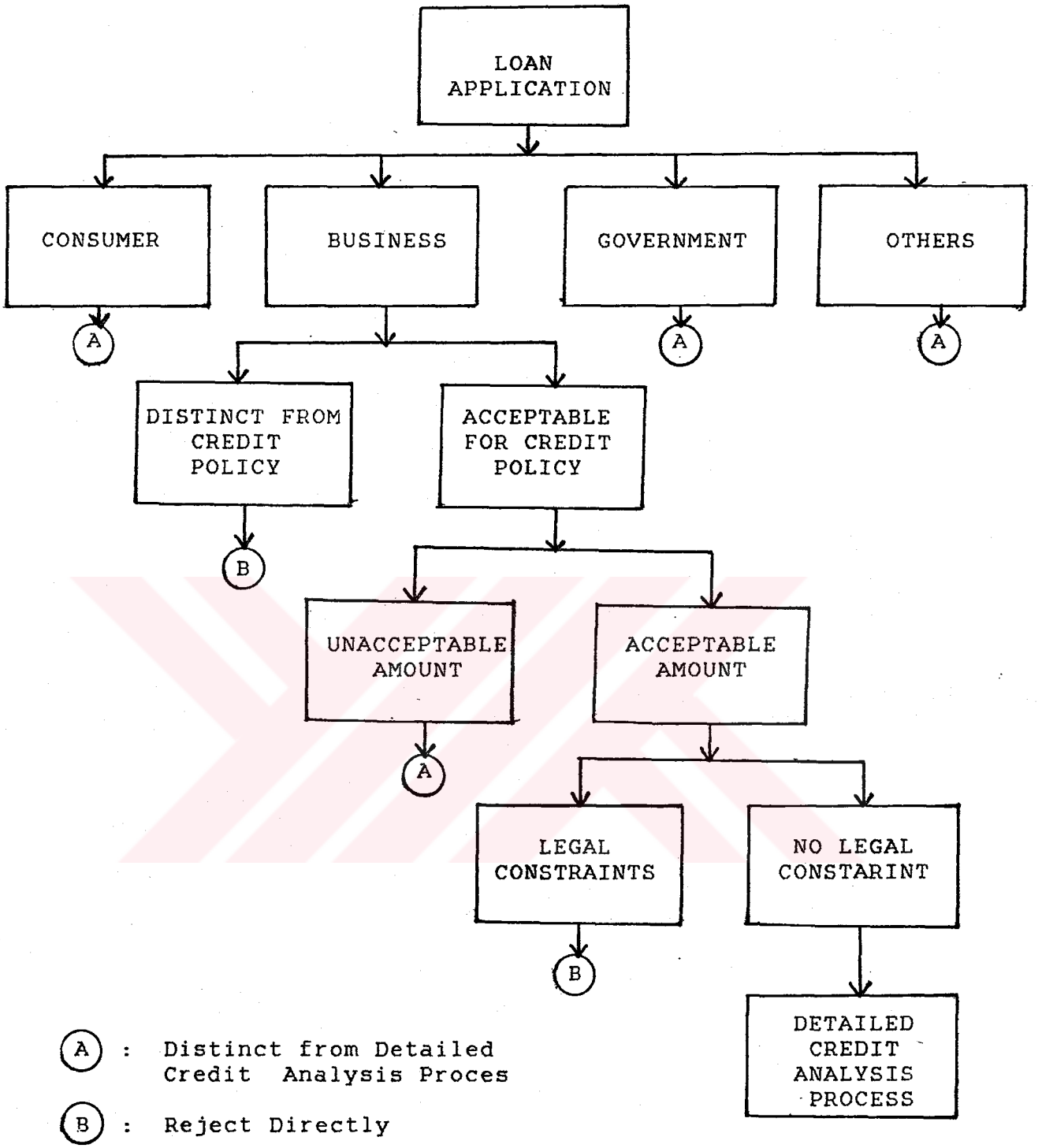


Figure 4.1 Prescreening Process

overall management (willingness), to determine its likelihood to repay the loan.

- the applicant's financial situation and capital situation to assess the company's financial strength.
- the business' collateral and the personal collateral to back any loan.
- the applicant's marketing capabilities and operational characteristics, as well as the competitive environment and the company's future strategic position in the markets it serves.

The management character analysis involves the questioning the honesty, integrity and character of the applicant's management as well as the credibility of the information supplied by them. The lending officer could identify other trouble signs while conducting an investigation of the company's trade and bank references. The investigation could indicate sudden or excessive borrowing, late payment of bills, borrowing continuously, excessive overdrafts or withdrawals against uncollected funds in business checking accounts, extensive and sudden changes in management, excessive cash balance declines, unusual or unrealistic plans for the future, poor plant or company appearance, poor employee attitude and moral.

Collateral, defined as an asset in which the bank takes a security interest, entitles a bank to cash derived from the

sale of the asset or assets in the event that the borrower defaults on the loan. The pledge of collateral normally adds safety to the loan. The lending officer when examining the financial statements or while visiting the applicant's facility, will look for the existence of collateral generally in the form of tangible assets (for example, stock certificates, bonds, certificates of deposit, buildings, land, equipment, inventory). Further questions asked include the collateral's marketability, appraised value and availability.

Capacity is another measure of the present and future health of the applicant company. It tells how successful a business has been in the past and will possibly be in the future. The investigation of sales and marketing capabilities involves studying the target market characteristics by asking such questions as who purchases the company's products or service, who uses the products or service, who influences the purchase decision, is the market stable. The objective here is to identify structure of the market, and the position of the company in this market. An assessment is also made of the market of company's product or service. The typical questions are the quality of products and services, does they match the requirements of the customers. Promotion and competitive situation are the other factors that affect the capacity of the company.

The most important and also the most complex part of detailed credit analysis is determining the financial strength of the company [GALLAGHER 1988]. It is performed by financial analysts who are the employees working in the credit information department of the bank. Financial strength is a measure of the applicant's financial ability to meet its loan commitment. To obtain the financial strength of a company, its financial statements (balance and income sheets) are analyzed, the relation between items of these sheets, their trends are examined by determining the other effects that cause some changes on them. These effects can sometimes be the results of other steps involved in detailed credit analysis such as the results of capacity determination. The items in these sheets are also compared with industry standards and the values in the past years.

A lending decision is based on the analysis of the factors described above. These factors are examined in order to obtain a conclusion about the overall credit risk of the applicant. However, the most important and the most critical factor among all these, is the financial statement analysis which gives the financial strength of a company. Also, there are recognized experts in the field of financial statement analysis to acquire knowledge. Expert decision skills are needed in this subject. The other factors which are capacity, collateral, and management character evaluation are not

included during the implementation, because their domain of expertises differ, as stated in Section 5.3.

As a result, financial statement analysis is chosen to be the appropriate domain of the expert system which will be constructed. The purpose of this system is to assign a value for the financial strength of the company which is under study.

4.2 Development of the Prototype

In this phase, after identifying the financial statements and choosing the appropriate method to analyze those statements, the expert system development tool to construct the system is selected. Finally, a small model of the system is designed.

4.2.1 Financial Statements

The most popular financial statements are balance and income sheets. Balance sheet is a table that shows the financial position of a company according to its accounting records. The assets, debts and equity capital of the company on a certain date are grouped on this sheet. A balance sheet has two columns: Assets and Liabilities. The items within these columns are summarized as follows [AKGÜÇ 1984]:

- Assets
  - . Cash and bank accounts
  - . Bonds
  - . Accounts receivable
  - . Stocks
  - . Commercial letter of credits
  - . Participations
  - . Fixed assets
  - . Loss account

- Liabilities
  - . Accounts payable (short term debts such as bank credits, commercial debts, advances, long term debts such as medium and long term credits, long term seller credits)
  - . Equity capital
  - . Contingency debts

Income sheet is a table which summarizes business activities and the results of those activities for a certain accounting period [BİRTÜRK and AKMAN 1990]. The items in the income sheet are given below [AKGÜÇ 1984]:

- Gross income
  - . Gross sales
  - . Discounts from sales
  - . Net sales
  - . Unit cost

. Gross profit

- Activity income
  . Management expenditures
  . Sales expenses
  . Doubtful accounts
  . Activity profit

- Net profit and loss
  . Financing expenses
  . Company profit before other income and expenses
  . Non-activity profit
  . Non-activity loss
  . Profit before taxes
  . Amount of taxes
  . Net profit

4.2.2 Methods Used in Financial Statement Analysis

The methods used in financial statement analysis can be divided into four groups [BİRTÜRK and AKMAN 1990]:

- Analysis with comparison
- Analysis with percentage method
- Trend Percentages
- Ratio analysis

Ratio analysis method is used throughout this study. The

reason to use the ratio analysis method is to provide better information about the financial strength, liquidity state, productivity, and the profit rate of the company which has requested the credit. Ratio, is a simple mathematical term which shows the relation between the two items in a financial statement. The ratios used can be grouped as follows [AKGÜÇ 1984]:

1- Ratios used in liquidity analysis

Liquidity ratios are used in order to estimate the short term debts of the company, measure its solvency and determine whether its capital is adequate or not. There are two ratios used within this group:

a) Working capital ratio:

Circulating values / Short term debts

Circulating values are the sum of cash and bank accounts, accounts receivable, bonds, commercial letter of credits, stocks.

b) Acid test ratio:

(Cash and Bank account + Bonds + Accounts receivable) / Short term debts

2- Activity ratios

Activity ratios are those related with the usage of economical assets.

a) Credit rate of turnover:

Total amount of credit sales / Commercial credits

b) Stock rate of turnover:

Unit cost / Average stock

c) Equity capital rate of turnover:

Net sales / Average equity capital

d) Asset rate of turnover:

Net sales / Assets

3- Ratios used in financial structure analysis

These ratios help to determine whether the company can fullfil its long term responsibilities:

a) Total debts / Equity capital

b) Total debts / Assets

c) Short term debts / Assets

d) Fixed assets (physical) / Equity capital (physical)

4- Ratios used for the evaluation of profit

Profit is the most important factor for the owners of the company. A firm cannot continue its activities if it cannot earn any profit. Therefore, these ratios determine whether the company will exist in the market in future. Also, the profit ratios show the power of the company to pay back its debts.

a) Activity profit / Net sales

b) Balance sheet profit / Net sales

c) Net profit / Net sales

d) Gross profit / Net sales

e) Net profit / Equity capital

f) Profit before taxes / Assets

4.2.3 Expert System Development Tool

Personal Consultant Plus has been chosen as the expert system development tool in this study because it uses both rules and frames for knowledge representation. It was also certain that the selected application would be more effective when constructed with a frame and rule-based development tool. Personal Consultant Plus has the features suggested by the needs of the application [WATERMAN 1986].

Personal Consultant Plus uses the following structures to control and organize information [PC+ 1985]:

- Frames
- Parameters
- Rules

The developer can organize knowledge into manageable units using frames. This technique helps to simplify a problem and controls the sequencing of a consultation as a series of sub-problems. Frames can be used to represent physical structure, sub-problems, individual events or any other conceptual relationships that exist in the application. The organization of a problem domain is specified as a hierarchical structure of frame descriptors. This

hierarchical structure is called a frame tree. Each frame descriptor contains a generic specification of a situation in terms of the facts (parameters), that should be used to represent the situation and the knowledge (rules) that can be applied. Personal Consultant Plus fills in the appropriate facts about an actual situation using the rules that are applicable. During a consultation, a frame is instantiated or entered only if the problem it addresses is appropriate to that particular consultation. Each frame can have the following properties [PC+ 1985]:

. Goals
. Promptever, Promptlst, Prompt2nd
. Translation
. Initialdata
. Displayresults

Personal Consultant Plus uses parameters to store information or facts in the knowledge base. The values of the parameters are determined by Personal Consultant Plus using the following techniques :

. asking the user questions
. using rules to infer a value
. executing a user-defined procedure
. using a default value
. using a combination of any of the above

Parameter groups allow the developer to keep logically related parameters together and associate them with specific frames. The system automatically creates a parameter group for each frame.

A numeric measure of confidence, called a "certainty factor" is automatically associated with each value of a parameter within a frame. The use of uncertain information is a standard part of Personal Consultant Plus and can arise when a user is unsure of a response or when a rule with an unsure conclusion is encountered. The certainty factor of a parameter ranges from 100% to -100%. Certainty factors are automatically calculated and propagated throughout a consultation. They are presented to the user for all conclusions with less than 100% confidence.

Like the properties for frames, parameters have also some properties which describe characteristics of the parameter such as :

. Type
. Translation
. Prompt
. Help
. Expect or Legalvalues

Personal Consultant Plus uses rules to infer values for parameters during a consultation. A rule specifies a

deduction that can be made in a particular situation. Each rule contains a premise or "if clause" that is evaluated to determine if its action, or then clause, is to be applied. Both the premise and action of a rule can be composed of compound statements connected with AND and OR connectors.

Rules are selected by Personal Consultant Plus for possible consideration during a consultation using a built-in control mechanism. Personal Consultant Plus supports a combination of backward and forward chaining control strategies. Backward chaining reduces the number of questions that the user is required to answer and presents a more natural ordering to a consultation. Forward chaining can be used to restrict a solution space, trigger actions based on special conditions or maintain logical consistency. Backward chaining or goal oriented control is the default control strategy for Personal Consultant Plus.

There are some other additional knowledge components provided within Personal Consultant Plus such as :

. Procedures
. Access Methods
. Meta-rules

In some cases, the value of a parameter can be more conveniently specified using a traditional programming approach. Personal Consultant Plus provides a means of

including user-defined procedures in a knowledge base. These procedures can be used to perform tasks such as reading data from files, displaying graphical information or performing complex iterative calculations.

Personal Consultant Plus allows the use of access methods to trigger actions based on access to certain parameters rather than through rules. An access method is attached to a specific parameter and allows any calculation or action to be taken whenever the value for that parameter is required or modified.

Metaknowledge or meta rules can be used in Personal Consultant Plus to supply information on how to best apply the other forms of knowledge, particularly rules. In rule-based systems, the system often must choose an order in which to consider several rules that could determine the value of a parameter. With metaknowledge, the developer can specify how this ordering should be performed. Metarules provide a clean way of specifying interrelationships between rules.

4.2.4 Documentation of the Prototype System

The prototype system is designed to assign an overall financial strength to an applicant company for short and medium term credits by using the ratio analysis method. Long term credit applications, in general, are distinct from

credit analysis or loan screening.

The financial analysts consider the financial strength of a company as weak, medium or strong [BİRTÜRK and AKMAN 1990]. Therefore, the system will assign a value in between 1 and 3, 1 stands for weak, 2 stands for medium and 3 for strong, to the overall financial strength of the company. The main problem is "how to determine the effects of the ratio groups which are, ratios used in liquidity analysis, activity ratios, ratios used in financial structure analysis, and ratios used for evaluation of profit, on the overall financial strength". Meanwhile, these effects differ for short and medium term credit analysis.

The overall structure of the prototype system that finds out the financial strength of a company, the ratio groups, and the ratios included in those groups are shown in Fig. 4.2. All these ratio groups take a value again in between 1 and 3 as mentioned above. They all have a constant impact factor on the overall financial strength of the company (between 1 and 10), which can be determined by their importance and the type of credit (short term, medium term) as shown in Table 4.1. The resulting financial strength is the mean of the products of constants and their grades (grades are between 1 and 3 as mentioned above).

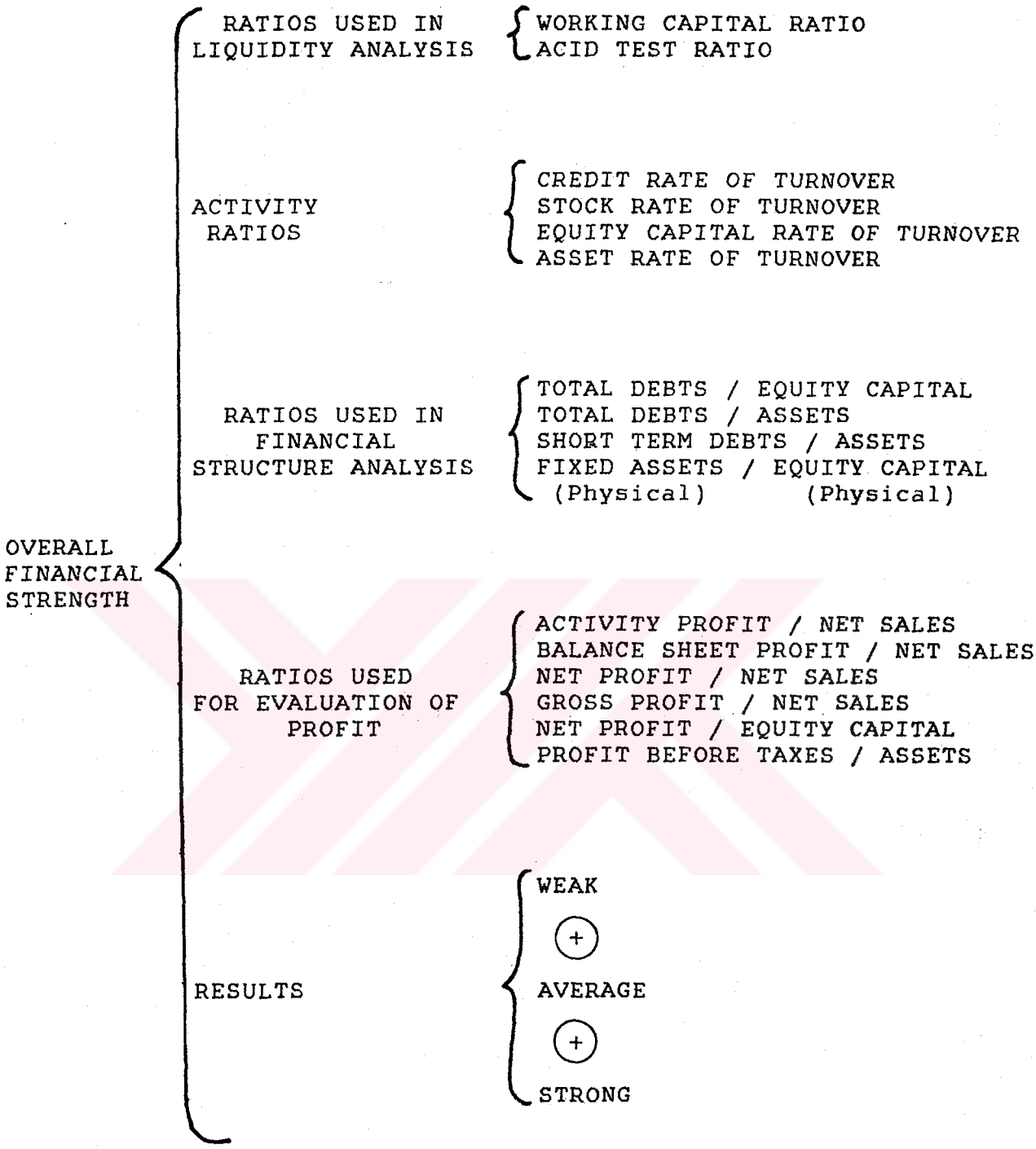


Figure 4.2 Warnier/Orr Diagram of Ratio Analysis

TABLE 4.1 Impact Factors of Ratio Groups

CREDIT TYPE	RATIO GROUPS			
	LIQUIDITY RATIOS	ACTIVITY RATIOS	FINANCIAL STRUCTURE RATIOS	PROFIT RATIOS
SHORT TERM	10	9	7	9
MEDIUM TERM	6	5	10	8

TABLE 4.2 Impact Factors of Ratios Within Parent Ratio Groups

RATIO GROUP	RATIOS	CREDIT TYPE	
		SHORT TERM	MEDIUM TERM
LIQUIDITY	WORKING CAPITAL	7	8
	ACID TEST	10	9
ACTIVITY	CREDIT RATE OF TURN.	10	7
	STOCK RATE OF TURN.	9	6
	EQUITY CAP. RATE OF TURN.	6	10
	ASSET RATE OF TURN.	7	8
FINANCIAL STRUCTURE	TOTAL DEBTS/EQUITY CAPITAL	7	7
	TOTAL DEBTS/ASSETS	8	5
	SHORT TERM DEBTS/ASSETS	10	4
	FIXED ASSETS/EQUITY CAPITAL	4	10
PROFIT EVALUATION	ACTIVITY PROFIT/NET SALES	7	8
	BAL. SHEET PROFIT/NET SALES	8	10
	NET PROFIT/NET SALES	9	9
	GROSS PROFIT/NET SALES	3	6
	NET PROFIT/EQUITY CAPITAL	9	9
	PROFIT BEFORE TAXES/ASSETS	5	7

It can be formulated as follows:

F.S. = (c1*grade1 + c2*grade2 + c3*grade3 + c4*grade4) /
(c1 + c2 + c3 + c4)

where F.S. : overall financial strength

grade1 : estimated grade of ratios used in liquidity

grade2 : estimated grade of activity ratios

grade3 : estimated grade of ratios used in financial structure analysis

grade4 : estimated grade of profit ratios

c1, c2, c3, and c4 are the assigned impact factors to the above ratio groups.

After this formulation, the second question arises, "How can we determine the grades of these ratio groups?". It is obvious that, the grades of those ratio groups are found by using the ratios included within them. The ratios included in ratio groups, also, have impact factors according to their importance within this ratio group, and the type of credit. The mean of the products of the grades of ratios and their impact factors, for that ratio group, gives the overall grade of the examined ratio group. The impact factors of the ratios in their parent groups are given in Table 4.2.

The last step that is included in the prototype system is determining the grades of ratios within their parent ratio groups. The way to find out these grades is to compare the value of ratios with industry standards, and the company's

previous year ratio values. Comparison with industry standard and previous year value is as follows:

if ratio under study > industry standard
then grade of this ratio according to industry is 3
if ratio under study = industry standard
then grade of this ratio according to industry is 2
if ratio under study < industry standard
then grade of this ratio according to industry is 1
if ratio under study > previous year ratio value
then grade of this ratio according to previous year is 3
if ratio under study = previous year ratio value
then grade of this ratio according to previous year is 2
if ratio under study < previous year ratio value
then grade of this ratio according to previous year is 1

The industry standards are based on sector and ratio bases [KOÇYALKIN et al. 1987]. Previous year values can be obtained from the financial statements which belong to the previous year. The grades according to industry standards and previous year values, have also different effects upon the grade of the ratio which they belong. However the evaluation of industry standards and previous year values are not so simple as explained in the above if statements, because there are a lot of factors that may change the result of a ratio. The discovery and grouping of those factors for each ratio is described in the next section.

4.3 Construction

In this section the factors that affect the grade of a ratio according to industry standards and previous year values, are determined, then they are grouped, finally, the overall frame structure of the system is given. Factors are grouped according to the relations between them.

During the design of the complete system, it is observed that some ratios are affected by many factors, while the others are not affected at all. The relationship between those factors and ratios (according to industry standards, and previous year values) are grouped for evaluation in the following combinations :

1) Factors affecting working capital ratio

a) Type of sales, credit rate of turnover grade (another ratio), bills receivable, certainty to collect accounts receivable.

b) Type of purchase, distribution of short term debts, the availability of credit limit from banks, chance to consolidate the short term debts, the probability of a big payment soon.

c) Stock rate of turnover grade (another ratio), stability in the market, competition power.

d) The amount of assets which has a high degree of

liquidity, the probability of a possible decrease in the value of circulating assets.

e) Comparison of the amount of sales with respect to different seasons.

2) Factors affecting credit rate of turnover

Competition power, efficient collection of accounts receivable, restrictions on installments.

3) Factors affecting stock rate of turnover

a) The grades of activity profit / net sales ratio, gross profit / net sales ratio, balance sheet profit / net sales ratio, and net profit / net sales ratio.

b) Refreshment of the stocks, sufficiency of the stocks, competition power.

c) The quality of the goods, the amount of critical stock quantity, investment on the stocks.

d) Competition power, change in consumer taste.

4) Factors affecting equity capital rate of turnover

a) The grade of total debts / equity capital ratio.

b) Asset rate of turnover, stock rate of turnover, new or existing business.

5) Factors affecting total debts / equity capial ratio

a) Stability in the market, competition power.

b) The amount of assets which has a high degree of liquidity, credit rate of turnover.

6) Factors affecting fixed assets (physical) / equity capital (physical) ratio

The increase in the purchase of fixed assets.

7) Factors affecting short term debts / assets ratio

New or existing business.

8) Factors affecting total debts / assets ratio

The amount of assets which has a high degree of liquidity.

9) Factors affecting activity profit / net sales ratio

Changes in the prices of goods, changes in the cost of raw materials and goods, changes in the composition of goods.

10) Factors affecting profit before taxes / assets ratio

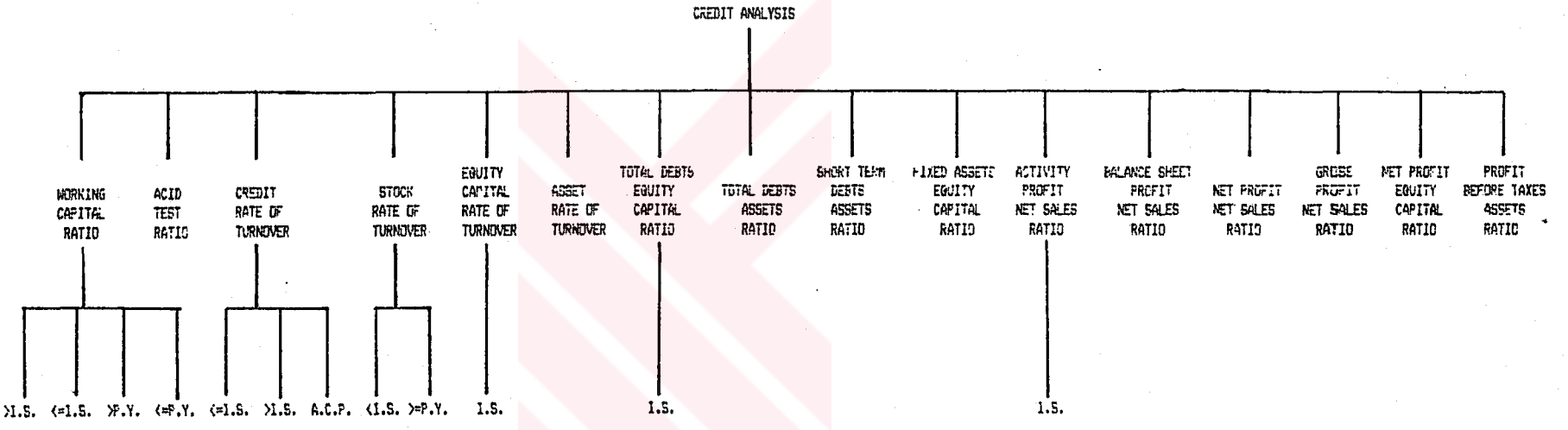
The profit distribution policy.

The acid test ratio, asset rate of turnover, balance sheet profit / net sales ratio, net profit / net sales ratio, gross profit / net sales ratio, net profit / equity capital ratio are not listed above. There are no factors affecting them, so their grades are evaluated by using the simple if-then structures given in Section 4.2.4 and considering the

type of credit (short, medium term). On the other hand, the factors and the type of credit have to be considered while assigning grades to the ones whose factors are listed above. Since it is a complex process, the Decision Table Technique is used during this operation [MOCKLER 1989].

Each ratio included in the system, presents a sub-problem property. The factors affecting them, with respect to both industry standards and previous year values, also present a sub-problem property. Therefore, these sub-problems are evaluated in different frames. The overall frame structure (frame tree) is given in Fig. 4.3. The leaves of the tree are the frames that include the factors affecting the ratios they belong. The relational operators identify the conditions for the instantiation of those subframes (leaves of the tree).

For example, ">I.S." means : This subframe includes the factors affecting the parent frame and it will be instantiated when the related ratio is greater than the industry standard.



A.C.P. : Average Collection Period

I.S. : Industry Standard

P.Y. : Previous Year Value

RELATIONAL OPERATORS : The conditions for frame instantiation

Figure 4.3 Frame Tree of the Implemented System

V. SUMMARY AND CONCLUSIONS

5.1 Summary

By the recent developments in Artificial Intelligence technology, Expert Systems, which is a branch of Artificial Intelligence, are being developed in various areas. Banking applications are one of those suitable fields in which the expert systems will be of great use to the banks. The reason for that is the service based nature and competition environment in banking. However, some of the applications in banking are not suitable for expert systems development.

In the study, after an introductory chapter on the subject, expert systems are studied in general. In that chapter, the major characteristics and the classification of expert systems are explained and the major components of an expert system are stated. Also, the stages of expert system development are given with the software considerations.

Next chapter is devoted to expert systems in banking where suitable applications in banking for expert system development are studied.

The last chapter includes a banking application using an expert system shell named Personal Consultant Plus.

5.2 Conclusions

Credit analysis or loan screening is the most popular area for expert system applications. The area is wide. Therefore, a part of this area has been chosen for the implementation. Financial statement analysis which is the most critical and complex phase of credit analysis is handled in this study.

Personal Consultant Plus is selected for developing the application system because the financial statement analysis process is very appropriate to the characteristics of Personal Consultant Plus. The chosen area can easily be divided into sub-problems for an effective and understandable implementation. This speciality requires frames as the knowledge representation model with a rule-based structure for expressing the relationships.

After defining the financial statement analysis, a prototype system is developed, and a complete system is constructed over this prototype. The ratio analysis method is preferred among the methods used in financial statement analysis because of its accuracy and clearness. The implemented system assigns an overall financial strength to an applicant company as weak, medium or strong.

Expert system development in the area of financial

statement analysis can be seen as very useful, because of the variety of factors affecting a company's overall financial strength. However, in some cases or in some sectors, it is impossible to determine some unusual situations. During knowledge discovery process, the factors that have impact on ratios being used in the implementation, are evaluated, but they are narrow focused. On the other hand, an expert can look at the big picture, he can examine all aspects of a problem and see how they relate to the central issue [WATERMAN 1986]. These aspects not only affect the financial statements of a company but also the overall company structure as well.

The main purpose of the implemented system is to assist the financial analysts in the process of financial statement evaluation which is the most critical part of loan screening. The system never forgets the wide facts that affect the financial strength of a company. It also documents the reason and results of a fact that is evaluated, at any time during consultation. Since, ratio analysis method is an understandable tool used in financial statement analysis, the results and explanations during the consultation process are well-understood by the experts.

As a result, the system can be successful while determining the financial strength of an applicant company without unusual side-effects. However, if there is any

unexpected effect that has an impact on the overall structure or activity of the company, then the system can only be used as an assistant of the financial analyst in his work.

5.3 Suggestions for Further Research

There are various number of banking applications suitable for developing an expert system. Credit analysis is the most popular one among them. In this study a critical part of this process is implemented. Financial statement analysis evaluates the financial strength, but not the total risk that has to be estimated for a company in credit analysis. The overall management character determination, marketing capabilities, and collateral evaluation for the applicant company are the other parts of total credit analysis approach. These processes are also very suitable for developing an expert system. However their domain of expertise differs according to the operations they are dealing with. For example, an expert who determines the overall management character of a company, has to be well-educated in human qualification. On the other hand, collateral evaluation is closely related with civil engineering, architecture, land registration, and the market conditions of these fixed assets. The combination of financial statement analysis, which was implemented in this study, with those processes explained above, can form an

expert system which will satisfy all the expectations of banking employees during credit analysis.

Another interesting and important subject which is a sub-set of credit analysis is "Pro Forma Financial Statement" preparation. Simply, it is a guess of the fiancial statements of a company after the usage of the loan with respect to the application purpose. This field of credit analysis can also be developed as an expert system and can be used together with financial statement analysis.

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A P P E N D I X

AN EXPERT SYSTEM FOR FINANCIAL STATEMENT ANALYSIS

A. RULE GROUPS

B. PARAMETER GROUPS

C. VARIABLES and SYSTEM PARAMETERS

A. RULE GROUPS

Rule Group ADH-END<=-RULES

RULE089 [ADH-END<=-RULES]

If 1) FIRMANIN TAHSILAT POLITIKASI is ETKIN, or
2) KREDILI SATISLARDA KISITLAYICI is not true,
Then it is definite (100%) that ETKIN TAHSILAT,KREDILI SATISLARDA KISITLAYICI FAKTORLERI ALACAK DEVIR HIZI <= ENDUTRI STANDARTI is 3.

RULE090 [ADH-END<=-RULES]

If 1) FIRMANIN TAHSILAT POLITIKASI is ZAYIF, and
2) KREDILI SATISLARDA KISITLAYICI,
Then it is definite (100%) that ETKIN TAHSILAT,KREDILI SATISLARDA KISITLAYICI FAKTORLERI ALACAK DEVIR HIZI <= ENDUTRI STANDARTI is 2.

Rule Group ADH-END>-RULES

RULE091 [ADH-END>-RULES]

If 1) FIRMANIN PIYASA REKABETI is GUCLU, and
2) FIRMANIN TAHSILAT POLITIKASI is ETKIN, and
3) KREDILI SATISLARDA KISITLAYICI,
Then it is definite (100%) that REKABET,ETKIN TAHSILAT KREDILI SATISLARDA KISITLAYICI FAKTORLERI ALACAK DEVIR HIZI > ENDUSTRI STANDARTI is 3.

RULE092 [ADH-END>-RULES]

If 1) 1) FIRMANIN PIYASA REKABETI is GUCLU, and
2) FIRMANIN TAHSILAT POLITIKASI is ETKIN, and
3) KREDILI SATISLARDA KISITLAYICI is not true, or
2) 1) FIRMANIN PIYASA REKABETI is GUCLU, and
2) FIRMANIN TAHSILAT POLITIKASI is ZAYIF, and
3) KREDILI SATISLARDA KISITLAYICI,
Then it is definite (100%) that REKABET,ETKIN TAHSILAT KREDILI SATISLARDA KISITLAYICI FAKTORLERI ALACAK DEVIR HIZI > ENDUSTRI STANDARTI is 2.

RULE093 [ADH-END>-RULES]

If 1) 1) FIRMANIN PIYASA REKABETI is GUCLU, and
2) FIRMANIN TAHSILAT POLITIKASI is ZAYIF, and
3) KREDILI SATISLARDA KISITLAYICI is not true, or
2) FIRMANIN PIYASA REKABETI is GUCSUZ,
Then it is definite (100%) that REKABET,ETKIN TAHSILAT KREDILI SATISLARDA KISITLAYICI FAKTORLERI ALACAK DEVIR HIZI > ENDUSTRI STANDARTI is 1.

Rule Group AKTIF-DEVIR-HIZI-RULES

RULE130 [AKTIF-DEVIR-HIZI-RULES]

If KREDININ TIPI is KISA-VADELI,
Then it is definite (100%) that AKTIF DEVIR HIZI PUANI is [[[10 times AKTIF DEVIR HIZI ENDUSTRI STANDARTI PUANI] plus [7 times AKTIF DEVIR HIZI GECMIS YIL PUANI]] divided by 17].

RULE131 [AKTIF-DEVIR-HIZI-RULES]

If KREDININ TIPI is ORTA-VADELI,
Then it is definite (100%) that AKTIF DEVIR HIZI PUANI is [[[8 times AKTIF DEVIR HIZI ENDUSTRI STANDARTI PUANI] plus [9 times AKTIF DEVIR HIZI GECMIS YIL PUANI]] divided by 17].

RULE132 [AKTIF-DEVIR-HIZI-RULES]

If [NET SATISLAR divided by AKTIFLERIN TOPLAMI] is greater than AKTIF DEVIR HIZI ENDUSTRI STANDARTI,
Then it is definite (100%) that AKTIF DEVIR HIZI ENDUSTRI STANDARTI PUANI is 3.

RULE133 [AKTIF-DEVIR-HIZI-RULES]

If [NET SATISLAR divided by AKTIFLERIN TOPLAMI] is less than AKTIF DEVIR HIZI ENDUSTRI STANDARTI,
Then it is definite (100%) that AKTIF DEVIR HIZI ENDUSTRI STANDARTI PUANI is 1.

RULE134 [AKTIF-DEVIR-HIZI-RULES]

If [NET SATISLAR divided by AKTIFLERIN TOPLAMI] is greater than AKTIF DEVIR HIZI GECMIS YIL ORANI,
Then it is definite (100%) that AKTIF DEVIR HIZI GECMIS YIL PUANI is 3.

RULE135 [AKTIF-DEVIR-HIZI-RULES]

If [NET SATISLAR divided by AKTIFLERIN TOPLAMI] is less than AKTIF DEVIR HIZI GECMIS YIL ORANI,
Then it is definite (100%) that AKTIF DEVIR HIZI GECMIS YIL PUANI is 1.

Rule Group ALACAK-DEVIR-HIZI-RULES

RULE080 [ALACAK-DEVIR-HIZI-RULES]

If KREDININ TIPI is KISA-VADELI,
Then it is definite (100%) that ALACAK DEVIR HIZI PUANI is [[[[8 times ENDUSTRI STANDARTLARINA GORE ALACAK DEVIR HIZ PUANI ETKILEYEN FAKTORLERDEN SONRA] plus [10 times GECMIS YILA GORE ALACAK DEVIR HIZ PUANI]] plus [9 times ALACAK ORTALAMA TAHSIL SURESI PUANI]] divided by 27].

RULE081 [ALACAK-DEVIR-HIZI-RULES]

If KREDININ TIPI is ORTA-VADELI,
Then it is definite (100%) that ALACAK DEVIR HIZI PUANI is [[[[7 times ENDUSTRI STANDARTLARINA GORE ALACAK DEVIR HIZ PUANI ETKILEYEN FAKTORLERDEN SONRA] plus [10 times GECMIS YILA GORE ALACAK DEVIR HIZ PUANI]] plus [8 times ALACAK ORTALAMA TAHSIL SURESI PUANI]] divided by 25].

RULE082 [ALACAK-DEVIR-HIZI-RULES]

If 1) PERSONEL ALACAGI, or
2) SABIT DEGER SATIS ALACAGI, or
3) 1) 1) FIRMA TIPI is TEK-SAHIPLI, or
2) FIRMA TIPI is ADI-ORTAKLIK, or
3) FIRMA TIPI is SAHIS-SIRKETI, and
2) FIRMANIN SAHIBINDEN ALACAGI, or
4) SATICI AVANSI, or
5) MUBAYA AVANSI, or
6) SUPHELI ALACAK PASIFTE VARMI,
Then it is definite (100%) that TICARI ALACAKLAR TOPLAMI is [TICARI ALACAKLAR TOPLAMI minus [[[[[PERSONEL ALACAK MIKTARI plus SABIT DEGER SATIS MIKTARI] plus FIRMA SAHIBINDEN ALACAK MIKTARI] plus SATICI AVANS MIKTARI] plus MUBAYA AVANS MIKTARI] plus SUPHELI ALACAK MIKTARI]].

RULE083 [ALACAK-DEVIR-HIZI-RULES]

If [KREDILI SATISLAR TOPLAMI divided by TICARI ALACAKLAR TOPLAMI] is less than GECMIS YIL ALACAK DEVIR HIZI,
Then it is definite (100%) that GECMIS YILA GORE ALACAK DEVIR HIZ PUANI is 3.

RULE084 [ALACAK-DEVIR-HIZI-RULES]

If [KREDILI SATISLAR TOPLAMI divided by TICARI ALACAKLAR TOPLAMI] is greater than GECMIS YIL ALACAK DEVIR HIZI,
Then it is definite (100%) that GECMIS YILA GORE ALACAK DEVIR HIZ PUANI is 1.

RULE085 [ALACAK-DEVIR-HIZI-RULES]

If [KREDILI SATISLAR TOPLAMI divided by TICARI ALACAKLAR TOPLAMI] is less than or equal to ALACAK DEVIR HIZI ENDUSTRI STANDARTI,
Then it is definite (100%) that ENDUSTRI STANDARTLARINA GORE ALACAK DEVIR HIZ PUANI ETKILEYEN FAKTORLERDEN SONRA is [[[10 times ENDUSTRI STANDATINA GORE HESAPLANAN PUAN] plus [7 times ETKIN TAHSILAT,KREDILI SATISLARDA KISITLAYICI FAKTORLERI ALACAK DEVIR HIZI <= ENDUTRI STANDARTI]] divided by 17].

RULE086 [ALACAK-DEVIR-HIZI-RULES]

If [KREDILI SATISLAR TOPLAMI divided by TICARI ALACAKLAR TOPLAMI] is greater than ALACAK DEVIR HIZI ENDUSTRI STANDARTI,
Then it is definite (100%) that ENDUSTRI STANDARTLARINA GORE ALACAK DEVIR HIZ PUANI ETKILEYEN FAKTORLERDEN SONRA is [[[10 times ENDUSTRI STANDATINA GORE HESAPLANAN PUAN] plus [8 times REKABET,ETKIN TAHSILAT KREDILI SATISLARDA KISITLAYICI FAKTORLERI ALACAK DEVIR HIZI > ENDUSTRI STANDARTI]] divided by 18].

RULE087 [ALACAK-DEVIR-HIZI-RULES]

If [KREDILI SATISLAR TOPLAMI divided by TICARI ALACAKLAR TOPLAMI] is less than ALACAK DEVIR HIZI ENDUSTRI STANDARTI,
Then it is definite (100%) that ENDUSTRI STANDATINA GORE HESAPLANAN PUAN is 3.

RULE088 [ALACAK-DEVIR-HIZI-RULES]

If [KREDILI SATISLAR TOPLAMI divided by TICARI ALACAKLAR TOPLAMI] is greater than ALACAK DEVIR HIZI ENDUSTRI STANDARTI,
Then it is definite (100%) that ENDUSTRI STANDATINA GORE HESAPLANAN PUAN is 1.

Rule Group ALACAK-ORTALAMA-TAH-RULES

RULE094 [ALACAK-ORTALAMA-TAH-RULES]

If 1) [[TICARI ALACAKLAR TOPLAMI times 360] divided by KREDILI SATISLAR TOPLAMI] is greater than or equal to GECEN YIL ORTALAMA TAHSIL SURESI, and
2) [[TICARI ALACAKLAR TOPLAMI times 360] divided by KREDILI SATISLAR TOPLAMI] is greater than FIRMANIN ORTALAMA VADESI,
Then it is definite (100%) that ALACAK ORTALAMA TAHSIL SURESI PUANI is 1.

RULE095 [ALACAK-ORTALAMA-TAH-RULES]

If 1) 1) [[TICARI ALACAKLAR TOPLAMI times 360] divided by KREDILI SATISLAR TOPLAMI] is greater than or equal to GECEN YIL ORTALAMA TAHSIL SURESI, and
2) [[TICARI ALACAKLAR TOPLAMI times 360] divided by KREDILI SATISLAR TOPLAMI] is less than or equal to FIRMANIN ORTALAMA VADESI, or
2) 1) [[TICARI ALACAKLAR TOPLAMI times 360] divided by KREDILI SATISLAR TOPLAMI] is less than GECEN YIL ORTALAMA TAHSIL SURESI, and
2) [[TICARI ALACAKLAR TOPLAMI times 360] divided by KREDILI SATISLAR TOPLAMI] is greater than FIRMANIN ORTALAMA VADESI,
Then it is definite (100%) that ALACAK ORTALAMA TAHSIL SURESI PUANI is 2.

RULE096 [ALACAK-ORTALAMA-TAH-RULES]

If 1) [[TICARI ALACAKLAR TOPLAMI times 360] divided by KREDILI SATISLAR TOPLAMI] is less than GECEN YIL ORTALAMA TAHSIL SURESI, and
2) [[TICARI ALACAKLAR TOPLAMI times 360] divided by KREDILI SATISLAR TOPLAMI] is less than or equal to FIRMANIN ORTALAMA VADESI,
Then it is definite (100%) that ALACAK ORTALAMA TAHSIL SURESI PUANI is 3.

Rule Group BILANCO-KAR-NET-RULES

RULE181 [BILANCO-KAR-NET-RULES]

If KREDININ TIPI is KISA-VADELI,
Then it is definite (100%) that BILANCO KARI / NET SATISLAR is [[[6 times BILANCO KARI NET SATISLAR ORANI PUANI END. STANDARTINA GORE] plus [10 times BILANCO KARI NET SATISLAR PUANI GECMIS YILA GORE]] divided by 16].

RULE182 [BILANCO-KAR-NET-RULES]

If KREDININ TIPI is ORTA-VADELI,
Then it is definite (100%) that BILANCO KARI / NET SATISLAR is [[[4 times BILANCO KARI NET SATISLAR ORANI PUANI END. STANDARTINA GORE] plus [10 times BILANCO KARI NET SATISLAR PUANI GECMIS YILA GORE]] divided by 14].

RULE183 [BILANCO-KAR-NET-RULES]

If [BILANCO KARI divided by NET SATISLAR] is greater than BILANCO KARI NET SATISLAR END. STANDARTI,
Then it is definite (100%) that BILANCO KARI NET SATISLAR ORANI PUANI END. STANDARTINA GORE is 3.

RULE184 [BILANCO-KAR-NET-RULES]

If [BILANCO KARI divided by NET SATISLAR] is less than BILANCO KARI NET SATISLAR END. STANDARTI,
Then it is definite (100%) that BILANCO KARI NET SATISLAR ORANI PUANI END. STANDARTINA GORE is 1.

RULE185 [BILANCO-KAR-NET-RULES]

If [BILANCO KARI divided by NET SATISLAR] is greater than BILANCO KARI NET SATISLAR GECMIS YIL ORANI,
Then it is definite (100%) that BILANCO KARI NET SATISLAR PUANI GECMIS YILA GORE is 3.

RULE186 [BILANCO-KAR-NET-RULES]

If [BILANCO KARI divided by NET SATISLAR] is less than BILANCO KARI NET SATISLAR GECMIS YIL ORANI,
Then it is definite (100%) that BILANCO KARI NET SATISLAR PUANI GECMIS YILA GORE is 1.

Rule Group BORCLAR-AKTIFLER-RULES

RULE165 [BORCLAR-AKTIFLER-RULES]

If KREDININ TIPI is KISA-VADELI,
Then it is definite (100%) that BORCLAR / AKTIF TOPLAMI PUANI is [[[[9 times

BORCLAR AKTIF PUANI END. STANDARTINA GORE] plus [7 times BORCLAR AKTIF PUANI GECMIS YILA GORE]] plus [5 times BORCLAR AKTIF PUANINA DONER DEGERLERIN LIKIDITE ETKISI]] divided by 21].

RULE166 [BORCLAR-AKTIFLER-RULES]

If KREDININ TIPI is ORTA-VADELI,
Then it is definite (100%) that BORCLAR / AKTIF TOPLAMI PUANI is [[[[6 times BORCLAR AKTIF PUANI END. STANDARTINA GORE] plus [9 times BORCLAR AKTIF PUANI GECMIS YILA GORE]] plus [4 times BORCLAR AKTIF PUANINA DONER DEGERLERIN LIKIDITE ETKISI]] divided by 19].

RULE167 [BORCLAR-AKTIFLER-RULES]

If [BORCLAR TOPLAMI divided by AKTIFLERIN TOPLAMI] is less than BORCLAR AKTIF GECMIS YIL ORANI,
Then it is definite (100%) that BORCLAR AKTIF PUANI GECMIS YILA GORE is 3.

RULE168 [BORCLAR-AKTIFLER-RULES]

If [BORCLAR TOPLAMI divided by AKTIFLERIN TOPLAMI] is greater than BORCLAR AKTIF GECMIS YIL ORANI,
Then it is definite (100%) that BORCLAR AKTIF PUANI GECMIS YILA GORE is 1.

RULE169 [BORCLAR-AKTIFLER-RULES]

If [BORCLAR TOPLAMI divided by AKTIFLERIN TOPLAMI] is less than 0.5,
Then it is definite (100%) that BORCLAR AKTIF PUANI END. STANDARTINA GORE is 3.

RULE170 [BORCLAR-AKTIFLER-RULES]

If [BORCLAR TOPLAMI divided by AKTIFLERIN TOPLAMI] is greater than 0.5,
Then it is definite (100%) that BORCLAR AKTIF PUANI END. STANDARTINA GORE is 1.

RULE171 [BORCLAR-AKTIFLER-RULES]

If 1) DONER DEGERLER ICINDE LIKIDITESI YUKSEK OLANLARIN DIGERLERINE ORANI % OLARAK is less than or equal to 50, and
2) DONER DEGERLER ICINDE LIKIDITESI YUKSEK OLANLARIN DIGERLERINE ORANI % OLARAK is greater than 20,
Then it is definite (100%) that BORCLAR AKTIF PUANINA DONER DEGERLERIN LIKIDITE ETKISI is 2.

RULE172 [BORCLAR-AKTIFLER-RULES]

If DONER DEGERLER ICINDE LIKIDITESI YUKSEK OLANLARIN DIGERLERINE ORANI % OLARAK is less than or equal to 20,
Then it is definite (100%) that BORCLAR AKTIF PUANINA DONER DEGERLERIN LIKIDITE ETKISI is 1.

RULE173 [BORCLAR-AKTIFLER-RULES]

If DONER DEGERLER ICINDE LIKIDITESI YUKSEK OLANLARIN DIGERLERINE ORANI % OLARAK is greater than 50,
Then it is definite (100%) that BORCLAR AKTIF PUANINA DONER DEGERLERIN LIKIDITE ETKISI is 3.

Rule Group BORCLAR-MADDIOZSER-RULES

RULE136 [BORCLAR-MADDIOZSER-RULES]

If KREDININ TIPI is KISA-VADELI,
Then it is definite (100%) that BORCLAR / MADDI OZ SERMAYE PUANI is [[[9 times BORCLAR MADDI OZSERMAYE PUANI END. STANDARTI ETKILEYEN FAKTORLERDEN SONRA] plus [8 times BORCLAR MADDI OZSERMAYE PUANI GECMIS YILA GORE]] divided by 17].

RULE137 [BORCLAR-MADDIOZSER-RULES]

If KREDININ TIPI is ORTA-VADELI,
Then it is definite (100%) that BORCLAR / MADDI OZ SERMAYE PUANI is [[[8 times BORCLAR MADDI OZSERMAYE PUANI END. STANDARTI ETKILEYEN FAKTORLERDEN SONRA] plus [9 times BORCLAR MADDI OZSERMAYE PUANI GECMIS YILA GORE]] divided by 17].

RULE138 [BORCLAR-MADDIOZSER-RULES]

If [BORCLAR TOPLAMI divided by MADDI OZSERMAYE] is less than GECMIS YIL BORCLAR MADDI OZSERMAYE ORANI,
Then it is definite (100%) that BORCLAR MADDI OZSERMAYE PUANI GECMIS YILA GORE is 3.

RULE139 [BORCLAR-MADDIOZSER-RULES]

If [BORCLAR TOPLAMI divided by MADDI OZSERMAYE] is greater than GECMIS YIL BORCLAR MADDI OZSERMAYE ORANI,

Then it is definite (100%) that BORCLAR MADDI OZSERMAYE PUANI GECMIS YILA GORE is 1.

RULE140 [BORCLAR-MADDIOZSER-RULES]

If [BORCLAR TOPLAMI divided by MADDI OZSERMAYE] is less than 1.,
Then it is definite (100%) that BORCLAR MADDI OZSERMAYE PUANI END. STANDARTINA GORE is 3.

RULE141 [BORCLAR-MADDIOZSER-RULES]

If [BORCLAR TOPLAMI divided by MADDI OZSERMAYE] is greater than 1.,
Then it is definite (100%) that BORCLAR MADDI OZSERMAYE PUANI END. STANDARTINA GORE is 1.

RULE142 [BORCLAR-MADDIOZSER-RULES]

If [BORCLAR TOPLAMI divided by MADDI OZSERMAYE] is greater than 1.,
Then it is definite (100%) that BORCLAR MADDI OZSERMAYE PUANI END. STANDARTI ETKILEYEN FAKTORLERDEN SONRA is [[[[[10 times BORCLAR MADDI OZSERMAYE PUANI END. STANDARTINA GORE] plus [7 times ISTIKRAR REKABET FAKTORLERI]] plus [8 times DONER DEGERLERIN LIKIDITE ORANI,ALACAK DEVIR HIZI FAKTORLERI]] plus [5 times VERILEN MAL HIZMET FIYATINDA OLABILECEK DUSMELER FAKTORU]] divided by 30].

RULE143 [BORCLAR-MADDIOZSER-RULES]

If [BORCLAR TOPLAMI divided by MADDI OZSERMAYE] is less than or equal to 1.,

Then it is definite (100%) that BORCLAR MADDI OZSERMAYE PUANI END. STANDARTI ETKILEYEN FAKTORLERDEN SONRA is [[[[[10 times BORCLAR MADDI OZSERMAYE PUANI END. STANDARTINA GORE] plus [9 times ISTIKRAR REKABET FAKTORLERI]] plus [7 times DONER DEGERLERIN LIKIDITE ORANI,ALACAK DEVIR HIZI FAKTORLERI]] plus [4 times VERILEN MAL HIZMET FIYATINDA OLABILECEK DUSMELER FAKTORU]] divided by 30].

Rule Group BORMADDI-END-RULES

RULE144 [BORMADDI-END-RULES]

If 1) SATISLAR ISTIKRARLIMI is ISTIKRARLI, and

2) FIRMANIN PIYASA REKABETI is GUCLU,
Then it is definite (100%) that ISTIKRAR REKABET FAKTORLERI is 3.

RULE145 [BORMADDI-END-RULES]

If FIRMANIN PIYASA REKABETI is GUCSUZ,
Then it is definite (100%) that ISTIKRAR REKABET FAKTORLERI is 1.

RULE146 [BORMADDI-END-RULES]

If 1) SATISLAR ISTIKRARLIMI is ISTIKRARSIZ, and
2) FIRMANIN PIYASA REKABETI is GUCLU,
Then it is definite (100%) that ISTIKRAR REKABET FAKTORLERI is 2.

RULE147 [BORMADDI-END-RULES]

If 1) DONER DEGERLER ICINDE LIKIDITESI YUKSEK OLANLARIN DIGERLERINE ORANI % OLARAK is greater than or equal to 50, and
2) ALACAK DEVIR HIZI PUANI is greater than or equal to 2,
Then it is definite (100%) that DONER DEGERLERIN LIKIDITE ORANI,ALACAK DEVIR HIZI FAKTORLERI is 3.

RULE148 [BORMADDI-END-RULES]

If ALACAK DEVIR HIZI PUANI is less than 2,
Then it is definite (100%) that DONER DEGERLERIN LIKIDITE ORANI,ALACAK DEVIR HIZI FAKTORLERI is 1.

RULE149 [BORMADDI-END-RULES]

If 1) DONER DEGERLER ICINDE LIKIDITESI YUKSEK OLANLARIN DIGERLERINE ORANI % OLARAK is less than 50, and
2) ALACAK DEVIR HIZI PUANI is greater than or equal to 2,
Then it is definite (100%) that DONER DEGERLERIN LIKIDITE ORANI,ALACAK DEVIR HIZI FAKTORLERI is 2.

RULE150 [BORMADDI-END-RULES]

If 1) [BORCLAR TOPLAMI divided by MADDI OZSERMAYE] is less than or equal to 1, or
2) the measure of certainty associated with URETILE MAL VEYA HIZMETLERIN FIYATLARINDA DUSME OLASILIGI is less than 50,
Then it is definite (100%) that VERILEN MAL HIZMET FIYATINDA OLABILECEK DUSMELER FAKTORU is 3.

RULE151 [BORMADDI-END-RULES]

If 1) [BORCLAR TOPLAMI divided by MADDI OZSERMAYE] is greater than 1, and
2) URETILE MAL VEYA HIZMETLERIN FIYATLARINDA DUSME OLASILIGI is greater than or equal to 50,
Then it is definite (100%) that VERILEN MAL HIZMET FIYATINDA OLABILECEK DUSMELER FAKTORU is 1.

Rule Group BRSATISKARI-NETSATIS-RULES

RULE193 [BRSATISKARI-NETSATIS-RULES]

If KREDININ TIPI is KISA-VADELI,
Then it is definite (100%) that BRUT SATIS KARI / NET SATISLAR is [[[6 times BRUT SATIS KARI NET SATISLAR ORANI PUANI END. STANDARTINA GORE] plus [10 times BRUT SATIS KARI NET SATISLAR ORANI PUANI GECMIS YILA GORE]] divided by 16].

RULE194 [BRSATISKARI-NETSATIS-RULES]

If KREDININ TIPI is ORTA-VADELI,
Then it is definite (100%) that BRUT SATIS KARI / NET SATISLAR is [[[4 times BRUT SATIS KARI NET SATISLAR ORANI PUANI END. STANDARTINA GORE] plus [8 times BRUT SATIS KARI NET SATISLAR ORANI PUANI GECMIS YILA GORE]] divided by 12].

RULE195 [BRSATISKARI-NETSATIS-RULES]

If [BRUT SATISLAR KARI divided by NET SATISLAR] is greater than BRUT SATIS KARI NET SATISLAR END. STANDARTI,
Then it is definite (100%) that BRUT SATIS KARI NET SATISLAR ORANI PUANI END. STANDARTINA GORE is 3.

RULE196 [BRSATISKARI-NETSATIS-RULES]

If [BRUT SATISLAR KARI divided by NET SATISLAR] is less than BRUT SATIS KARI NET SATISLAR END. STANDARTI,
Then it is definite (100%) that BRUT SATIS KARI NET SATISLAR ORANI PUANI END. STANDARTINA GORE is 1.

RULE197 [BRSATISKARI-NETSATIS-RULES]

If [BRUT SATISLAR KARI divided by NET SATISLAR] is greater than BRUT SATIS

KARI NET SATISLAR GECMIS YIL ORANI,
Then it is definite (100%) that BRUT SATIS KARI NET SATISLAR ORANI PUANI
GECMIS YILA GORE is 3.

RULE198 [BRSATISKARI-NETSATIS-RULES]

If [BRUT SATISLAR KARI divided by NET SATISLAR] is less than BRUT SATIS KARI
NET SATISLAR GECMIS YIL ORANI,
Then it is definite (100%) that BRUT SATIS KARI NET SATISLAR ORANI PUANI
GECMIS YILA GORE is 1.

Rule Group CARI-ORAN-END<=-RULES

RULE033 [CARI-ORAN-END<=-RULES]

If 1) SATISLARIN TIPI VADELI/VADESIZ is VADESIZ, and
2) ALACAK DEVIR HIZI PUANI is greater than 2, and
3) the measure of certainty associated with TICARI ALACAKLARIN SENETLI
SENETSIZ DAGILIMI is greater than or equal to 70, and
4) the measure of certainty associated with ALACAKLARIN TAHSIL EDILEBILME
OLASILIGI is greater than or equal to 80,
Then it is definite (100%) that SATIS TIPI,ALACAK DEVIR HIZI,TICARI
ALACAKLARININ SENETLI SENETSIZ DAGILIMI,ALACAK TAHSIL EDILEBILME OLASILIK
FAKTORLERI HESAPLANAN ORAN <= ENDUSTRI STANDARTI is 3.

RULE034 [CARI-ORAN-END<=-RULES]

If 1) SATISLARIN TIPI VADELI/VADESIZ is VADESIZ, and
2) ALACAK DEVIR HIZI PUANI is greater than 2, and
3) the measure of certainty associated with ALACAKLARIN TAHSIL EDILEBILME
OLASILIGI is less than 80,
Then it is definite (100%) that SATIS TIPI,ALACAK DEVIR HIZI,TICARI
ALACAKLARININ SENETLI SENETSIZ DAGILIMI,ALACAK TAHSIL EDILEBILME OLASILIK
FAKTORLERI HESAPLANAN ORAN <= ENDUSTRI STANDARTI is 2.

RULE035 [CARI-ORAN-END<=-RULES]

If 1) ALACAK DEVIR HIZI PUANI is less than or equal to 2, and
2) the measure of certainty associated with TICARI ALACAKLARIN SENETLI
SENETSIZ DAGILIMI is greater than or equal to 70, and
3) the measure of certainty associated with ALACAKLARIN TAHSIL EDILEBILME
OLASILIGI is greater than or equal to 80,

Then it is definite (100%) that SATIS TIPI,ALACAK DEVIR HIZI,TICARI ALACAKLARININ SENETLI SENETSIZ DAGILIMI,ALACAK TAHSIL EDILEBILME OLASILIK FAKTORLERI HESAPLANAN ORAN <= ENDUSTRI STANDARTI is 2.

RULE036 [CARI-ORAN-END<=-RULES]

If 1) SATISLARIN TIPI VADELI/VADESIZ is VADESIZ, and
2) ALACAK DEVIR HIZI PUANI is greater than 2, and
3) the measure of certainty associated with TICARI ALACAKLARIN SENETLI SENETSIZ DAGILIMI is less than 70, and
4) the measure of certainty associated with ALACAKLARIN TAHSIL EDILEBILME OLASILIGI is greater than or equal to 80,

Then it is definite (100%) that SATIS TIPI,ALACAK DEVIR HIZI,TICARI ALACAKLARININ SENETLI SENETSIZ DAGILIMI,ALACAK TAHSIL EDILEBILME OLASILIK FAKTORLERI HESAPLANAN ORAN <= ENDUSTRI STANDARTI is 2.

RULE037 [CARI-ORAN-END<=-RULES]

If 1) SATISLARIN TIPI VADELI/VADESIZ is VADELI, and
2) ALACAK DEVIR HIZI PUANI is greater than 2, and
3) the measure of certainty associated with TICARI ALACAKLARIN SENETLI SENETSIZ DAGILIMI is greater than or equal to 70, and
4) the measure of certainty associated with ALACAKLARIN TAHSIL EDILEBILME OLASILIGI is greater than or equal to 80,

Then it is definite (100%) that SATIS TIPI,ALACAK DEVIR HIZI,TICARI ALACAKLARININ SENETLI SENETSIZ DAGILIMI,ALACAK TAHSIL EDILEBILME OLASILIK FAKTORLERI HESAPLANAN ORAN <= ENDUSTRI STANDARTI is 2.

RULE038 [CARI-ORAN-END<=-RULES]

If 1) 1) ALACAK DEVIR HIZI PUANI is less than or equal to 2, and
2) the measure of certainty associated with TICARI ALACAKLARIN SENETLI SENETSIZ DAGILIMI is less than 70, or
2) 1) SATISLARIN TIPI VADELI/VADESIZ is VADELI, and
2) ALACAK DEVIR HIZI PUANI is greater than 2, and
3) the measure of certainty associated with TICARI ALACAKLARIN SENETLI SENETSIZ DAGILIMI is less than 70,

Then it is definite (100%) that SATIS TIPI,ALACAK DEVIR HIZI,TICARI ALACAKLARININ SENETLI SENETSIZ DAGILIMI,ALACAK TAHSIL EDILEBILME OLASILIK FAKTORLERI HESAPLANAN ORAN <= ENDUSTRI STANDARTI is 1.

RULE039 [CARI-ORAN-END<=-RULES]

If 1) ALACAK DEVIR HIZI PUANI is less than or equal to 2, and
2) the measure of certainty associated with TICARI ALACAKLARIN SENETLI SENETSIZ DAGILIMI is greater than or equal to 70, and
3) the measure of certainty associated with ALACAKLARIN TAHSIL EDILEBILME

OLASILIGI is less than 80,
Then it is definite (100%) that SATIS TIPI,ALACAK DEVIR HIZI,TICARI ALACAKLARININ SENETLI SENETSIZ DAGILIMI,ALACAK TAHSIL EDILEBILME OLASILIK FAKTORLERI HESAPLANAN ORAN <= ENDUSTRI STANDARTI is 1.

RULE041 [CARI-ORAN-END<=-RULES]

If 1) SATISLARIN TIPI VADELI/VADESIZ is VADELI, and
2) ALACAK DEVIR HIZI PUANI is greater than 2, and
3) the measure of certainty associated with TICARI ALACAKLARIN SENETLI SENETSIZ DAGILIMI is greater than or equal to 70, and
4) the measure of certainty associated with ALACAKLARIN TAHSIL EDILEBILME OLASILIGI is less than 80,
Then it is definite (100%) that SATIS TIPI,ALACAK DEVIR HIZI,TICARI ALACAKLARININ SENETLI SENETSIZ DAGILIMI,ALACAK TAHSIL EDILEBILME OLASILIK FAKTORLERI HESAPLANAN ORAN <= ENDUSTRI STANDARTI is 1.

RULE042 [CARI-ORAN-END<=-RULES]

If 1) ALISLARIN TIPI VADELI/VADESIZ is VADELI, and
2) KISA VADELI BORCLARIN AYLARA GORE DAGILIMI is IYI, and
3) YAKIN BIR TARIHTE BUYUK BIR ODEMESI VARMI is not true,
Then it is definite (100%) that ALISLARIN TIPI,KISA VADELI BORCLARIN AYLARA GORE DAGILIMI,TICARI BANKALARDAN KREDI KULLANMA LIMITI-BORCLARI ROFINANS ETME-BORCLARI KONSOLIDE ETME,YAKIN TARIHTE BUYUK BIR ODEME VARMI FAKTORLERI HESAPLANAN ORAN <= ENDUSTRI STANDARTI is 3.

RULE043 [CARI-ORAN-END<=-RULES]

If 1) ALISLARIN TIPI VADELI/VADESIZ is VADELI, and
2) KISA VADELI BORCLARIN AYLARA GORE DAGILIMI is IYI, and
3) 1) TICARI BANKALARDA HER AN KULLANILABILIR LIMITI VARMI, or
2) BORCLARI ROFINANS EDEBILIRMI, or
3) BORCLARI KONSOLIDE ETME SANSI VARMI, and
4) YAKIN BIR TARIHTE BUYUK BIR ODEMESI VARMI,
Then it is definite (100%) that ALISLARIN TIPI,KISA VADELI BORCLARIN AYLARA GORE DAGILIMI,TICARI BANKALARDAN KREDI KULLANMA LIMITI-BORCLARI ROFINANS ETME-BORCLARI KONSOLIDE ETME,YAKIN TARIHTE BUYUK BIR ODEME VARMI FAKTORLERI HESAPLANAN ORAN <= ENDUSTRI STANDARTI is 2.

RULE044 [CARI-ORAN-END<=-RULES]

If 1) ALISLARIN TIPI VADELI/VADESIZ is VADELI, and
2) KISA VADELI BORCLARIN AYLARA GORE DAGILIMI is KOTU, and
3) 1) TICARI BANKALARDA HER AN KULLANILABILIR LIMITI VARMI, or
2) BORCLARI ROFINANS EDEBILIRMI, or
3) BORCLARI KONSOLIDE ETME SANSI VARMI, and

4) YAKIN BIR TARIHTE BUYUK BIR ODEMESI VARMI is not true,
Then it is definite (100%) that ALISLARIN TIPI,KISA VADELI BORCLARIN AYLARA GORE DAGILIMI,TICARI BANKALARDAN KREDI KULLANMA LIMITI-BORCLARI ROFINANS ETME-BORCLARI KONSOLIDE ETME,YAKIN TARIHTE BUYUK BIR ODEME VARMI FAKTORLERI HESAPLANAN ORAN <= ENDUSTRI STANDARTI is 2.

RULE045 [CARI-ORAN-END<=-RULES]

If 1) ALISLARIN TIPI VADELI/VADESIZ is VADESIZ, and
2) KISA VADELI BORCLARIN AYLARA GORE DAGILIMI is IYI, and
3) 1) TICARI BANKALARDA HER AN KULLANILABILIR LIMITI VARMI, or
2) BORCLARI ROFINANS EDEBILIRMI, or
3) BORCLARI KONSOLIDE ETME SANSI VARMI, and
4) YAKIN BIR TARIHTE BUYUK BIR ODEMESI VARMI is not true,
Then it is definite (100%) that ALISLARIN TIPI,KISA VADELI BORCLARIN AYLARA GORE DAGILIMI,TICARI BANKALARDAN KREDI KULLANMA LIMITI-BORCLARI ROFINANS ETME-BORCLARI KONSOLIDE ETME,YAKIN TARIHTE BUYUK BIR ODEME VARMI FAKTORLERI HESAPLANAN ORAN <= ENDUSTRI STANDARTI is 2.

RULE046 [CARI-ORAN-END<=-RULES]

If 1) 1) ALISLARIN TIPI VADELI/VADESIZ is VADESIZ, and
2) KISA VADELI BORCLARIN AYLARA GORE DAGILIMI is KOTU, or
2) 1) ALISLARIN TIPI VADELI/VADESIZ is VADESIZ, and
2) KISA VADELI BORCLARIN AYLARA GORE DAGILIMI is IYI, and
3) TICARI BANKALARDA HER AN KULLANILABILIR LIMITI VARMI is not true, and
4) BORCLARI ROFINANS EDEBILIRMI is not true, and
5) BORCLARI KONSOLIDE ETME SANSI VARMI is not true, or
3) 1) ALISLARIN TIPI VADELI/VADESIZ is VADELI, and
2) KISA VADELI BORCLARIN AYLARA GORE DAGILIMI is KOTU, and
3) TICARI BANKALARDA HER AN KULLANILABILIR LIMITI VARMI is not true, and
4) BORCLARI ROFINANS EDEBILIRMI is not true, and
5) BORCLARI KONSOLIDE ETME SANSI VARMI is not true,
Then it is definite (100%) that ALISLARIN TIPI,KISA VADELI BORCLARIN AYLARA GORE DAGILIMI,TICARI BANKALARDAN KREDI KULLANMA LIMITI-BORCLARI ROFINANS ETME-BORCLARI KONSOLIDE ETME,YAKIN TARIHTE BUYUK BIR ODEME VARMI FAKTORLERI HESAPLANAN ORAN <= ENDUSTRI STANDARTI is 1.

RULE047 [CARI-ORAN-END<=-RULES]

If 1) ALISLARIN TIPI VADELI/VADESIZ is VADELI, and
2) KISA VADELI BORCLARIN AYLARA GORE DAGILIMI is IYI, and
3) TICARI BANKALARDA HER AN KULLANILABILIR LIMITI VARMI is not true, and
4) BORCLARI ROFINANS EDEBILIRMI is not true, and
5) BORCLARI KONSOLIDE ETME SANSI VARMI is not true, and
6) YAKIN BIR TARIHTE BUYUK BIR ODEMESI VARMI,

Then it is definite (100%) that ALISLARIN TIPI,KISA VADELI BORCLARIN AYLARA GORE DAGILIMI,TICARI BANKALARDAN KREDI KULLANMA LIMITI-BORCLARI ROFINANS ETME-BORCLARI KONSOLIDE ETME,YAKIN TARIHTE BUYUK BIR ODEME VARMI FAKTORLERI HESAPLANAN ORAN <= ENDUSTRI STANDARTI is 1.

RULE048 [CARI-ORAN-END<=-RULES]

If 1) ALISLARIN TIPI VADELI/VADESIZ is VADELI, and
2) KISA VADELI BORCLARIN AYLARA GORE DAGILIMI is KOTU, and
3) 1) TICARI BANKALARDA HER AN KULLANILABILIR LIMITI VARMI, or
2) BORCLARI ROFINANS EDEBILIRMI, or
3) BORCLARI KONSOLIDE ETME SANSI VARMI, and
4) YAKIN BIR TARIHTE BUYUK BIR ODEMESI VARMI,
Then it is definite (100%) that ALISLARIN TIPI,KISA VADELI BORCLARIN AYLARA GORE DAGILIMI,TICARI BANKALARDAN KREDI KULLANMA LIMITI-BORCLARI ROFINANS ETME-BORCLARI KONSOLIDE ETME,YAKIN TARIHTE BUYUK BIR ODEME VARMI FAKTORLERI HESAPLANAN ORAN <= ENDUSTRI STANDARTI is 1.

RULE049 [CARI-ORAN-END<=-RULES]

If 1) ALISLARIN TIPI VADELI/VADESIZ is VADESIZ, and
2) KISA VADELI BORCLARIN AYLARA GORE DAGILIMI is IYI, and
3) 1) TICARI BANKALARDA HER AN KULLANILABILIR LIMITI VARMI, or
2) BORCLARI ROFINANS EDEBILIRMI, or
3) BORCLARI KONSOLIDE ETME SANSI VARMI, and
4) YAKIN BIR TARIHTE BUYUK BIR ODEMESI VARMI,
Then it is definite (100%) that ALISLARIN TIPI,KISA VADELI BORCLARIN AYLARA GORE DAGILIMI,TICARI BANKALARDAN KREDI KULLANMA LIMITI-BORCLARI ROFINANS ETME-BORCLARI KONSOLIDE ETME,YAKIN TARIHTE BUYUK BIR ODEME VARMI FAKTORLERI HESAPLANAN ORAN <= ENDUSTRI STANDARTI is 1.

RULE050 [CARI-ORAN-END<=-RULES]

If 1) STOK DEVIR HIZI PUANI is greater than 2, and
2) SATISLAR ISTIKRARLIMI is ISTIKRARLI, and
3) FIRMANIN PIYASA REKABETI is GUCLU,
Then it is definite (100%) that STOK DEVIR HIZI,SATIS ISTIKRARI,PIYASA REKABETI FAKTORLERI HESAPLANAN ORAN <= ENDUSTRI STANDARTI is 3.

RULE051 [CARI-ORAN-END<=-RULES]

If 1) 1) STOK DEVIR HIZI PUANI is greater than 2, and
2) SATISLAR ISTIKRARLIMI is ISTIKRARSIZ, or
2) 1) STOK DEVIR HIZI PUANI is greater than 2, and
2) SATISLAR ISTIKRARLIMI is ISTIKRARLI, and
3) FIRMANIN PIYASA REKABETI is GUCSUZ, or
3) 1) STOK DEVIR HIZI PUANI is less than or equal to 2, and

2) SATISLAR ISTIKRARLIMI is ISTIKRARLI, and
3) FIRMANIN PIYASA REKABETI is GUCLU,
Then it is definite (100%) that STOK DEVIR HIZI,SATIS ISTIKRARI,PIYASA REKABETI FAKTORLERI HESAPLANAN ORAN <= ENDUSTRI STANDARTI is 2.

RULE052 [CARI-ORAN-END<=-RULES]

If 1) 1) STOK DEVIR HIZI PUANI is less than or equal to 2, and
2) SATISLAR ISTIKRARLIMI is ISTIKRARSIZ, or
2) 1) STOK DEVIR HIZI PUANI is less than or equal to 2, and
2) SATISLAR ISTIKRARLIMI is ISTIKRARLI, and
3) FIRMANIN PIYASA REKABETI is GUCSUZ,
Then it is definite (100%) that STOK DEVIR HIZI,SATIS ISTIKRARI,PIYASA REKABETI FAKTORLERI HESAPLANAN ORAN <= ENDUSTRI STANDARTI is 1.

RULE062 [CARI-ORAN-END<=-RULES]

If 1) DONER DEGERLER ICINDE LIKIDITESI YUKSEK OLANLARIN DIGERLERINE ORANI % OLARAK is greater than or equal to 50, and
2) the measure of certainty associated with DONER DEGERLERDE KIYMET DEGISIM OLASILIGI is less than 30,
Then it is definite (100%) that DONER DEGERLERIN LIKIDITESI YUKSEK OLANLARININ TOPLAMA ORANI,DONER DEGERLERDE KIYMET DEGISIKLIGI OLASILIK FAKTORLERI HESAPLANAN ORAN <= ENDUSTRI STANDARTI is 3.

RULE063 [CARI-ORAN-END<=-RULES]

If 1) DONER DEGERLER ICINDE LIKIDITESI YUKSEK OLANLARIN DIGERLERINE ORANI % OLARAK is greater than or equal to 50, and
2) the measure of certainty associated with DONER DEGERLERDE KIYMET DEGISIM OLASILIGI is greater than or equal to 30,
Then it is definite (100%) that DONER DEGERLERIN LIKIDITESI YUKSEK OLANLARININ TOPLAMA ORANI,DONER DEGERLERDE KIYMET DEGISIKLIGI OLASILIK FAKTORLERI HESAPLANAN ORAN <= ENDUSTRI STANDARTI is 2.

RULE064 [CARI-ORAN-END<=-RULES]

If DONER DEGERLER ICINDE LIKIDITESI YUKSEK OLANLARIN DIGERLERINE ORANI % OLARAK is less than 50,
Then it is definite (100%) that DONER DEGERLERIN LIKIDITESI YUKSEK OLANLARININ TOPLAMA ORANI,DONER DEGERLERDE KIYMET DEGISIKLIGI OLASILIK FAKTORLERI HESAPLANAN ORAN <= ENDUSTRI STANDARTI is 1.

RULE070 [CARI-ORAN-END<=-RULES]

If 1) 1) SATISLAR MEVSIMLIK HAREKETLER GOSTERIYORMU, and

2) BILANCO MEVSIMLIK HAREKETLERIN OLDUGU DONEMDEMI HAZIRLANDI, or
2) SATISLAR MEVSIMLIK HAREKETLER GOSTERIYORMU is not true,
Then it is definite (100%) that MEVSIMLIK HAREKET,BILANCONUN O MEVSIMDE DUZENLENME FAKTORLERI HESAPLANAN ORAN <= ENDUSTRI STANDARTI is 1.

RULE071 [CARI-ORAN-END<=-RULES]

If 1) SATISLAR MEVSIMLIK HAREKETLER GOSTERIYORMU, and
2) BILANCO MEVSIMLIK HAREKETLERIN OLDUGU DONEMDEMI HAZIRLANDI is not true,

Then it is definite (100%) that MEVSIMLIK HAREKET,BILANCONUN O MEVSIMDE DUZENLENME FAKTORLERI HESAPLANAN ORAN <= ENDUSTRI STANDARTI is 3.

Rule Group CARI-ORAN-END>-RULES

RULE053 [CARI-ORAN-END>-RULES]

If 1) 1) STOK DEVIR HIZI PUANI is greater than or equal to 2, and
2) SATISLAR ISTIKRARLIMI is ISTIKRARLI, or
2) 1) STOK DEVIR HIZI PUANI is greater than or equal to 2, and
2) SATISLAR ISTIKRARLIMI is ISTIKRARSIZ, and
3) FIRMANIN PIYASA REKABETI is GUCLU, or
3) 1) STOK DEVIR HIZI PUANI is less than 2, and
2) SATISLAR ISTIKRARLIMI is ISTIKRARLI, and
3) FIRMANIN PIYASA REKABETI is GUCLU,
Then it is definite (100%) that STOK DEVIR HIZI,SATIS ISTIKRARI,PIYASA REKABETI FAKTORLERI HESAPLANAN ORAN > ENDUSTRI STANDARTI is 3.

RULE054 [CARI-ORAN-END>-RULES]

If 1) 1) STOK DEVIR HIZI PUANI is greater than or equal to 2, and
2) SATISLAR ISTIKRARLIMI is ISTIKRARSIZ, and
3) FIRMANIN PIYASA REKABETI is GUCSUZ, or
2) 1) STOK DEVIR HIZI PUANI is less than 2, and
2) SATISLAR ISTIKRARLIMI is ISTIKRARLI, and
3) FIRMANIN PIYASA REKABETI is GUCSUZ,
Then it is definite (100%) that STOK DEVIR HIZI,SATIS ISTIKRARI,PIYASA REKABETI FAKTORLERI HESAPLANAN ORAN > ENDUSTRI STANDARTI is 2.

RULE055 [CARI-ORAN-END>-RULES]

If 1) STOK DEVIR HIZI PUANI is less than 2, and

2) SATISLAR ISTIKRARLIMI is ISTIKRARSIZ,
Then it is definite (100%) that STOK DEVIR HIZI,SATIS ISTIKRARI,PIYASA REKABETI FAKTORLERI HESAPLANAN ORAN > ENDUSTRI STANDARTI is 1.

RULE056 [CARI-ORAN-END>-RULES]

If 1) SATISLARIN TIPI VADELI/VADESIZ is VADESIZ, and
2) ALACAK DEVIR HIZI PUANI is less than 2,
Then it is definite (100%) that SATIS TIPI,ALACAK DEVIR HIZI,TICARI ALACAKLARININ SENETLI SENETSIZ DAGILIMI FAKTORLERI HESAPLANAN ORAN > ENDUSTRI STANDARTI is 1.

RULE057 [CARI-ORAN-END>-RULES]

If 1) 1) SATISLARIN TIPI VADELI/VADESIZ is VADELI, and
2) ALACAK DEVIR HIZI PUANI is less than 2, and
3) the measure of certainty associated with TICARI ALACAKLARIN SENETLI SENETSIZ DAGILIMI is less than 50, or
2) 1) SATISLARIN TIPI VADELI/VADESIZ is VADESIZ, and
2) ALACAK DEVIR HIZI PUANI is greater than or equal to 2, and
3) the measure of certainty associated with TICARI ALACAKLARIN SENETLI SENETSIZ DAGILIMI is less than 50,
Then it is definite (100%) that SATIS TIPI,ALACAK DEVIR HIZI,TICARI ALACAKLARININ SENETLI SENETSIZ DAGILIMI FAKTORLERI HESAPLANAN ORAN > ENDUSTRI STANDARTI is 2.

RULE058 [CARI-ORAN-END>-RULES]

If 1) 1) SATISLARIN TIPI VADELI/VADESIZ is VADELI, and
2) ALACAK DEVIR HIZI PUANI is greater than or equal to 2, or
2) 1) SATISLARIN TIPI VADELI/VADESIZ is VADELI, and
2) ALACAK DEVIR HIZI PUANI is less than 2, and
3) the measure of certainty associated with TICARI ALACAKLARIN SENETLI SENETSIZ DAGILIMI is greater than or equal to 50, or
3) 1) SATISLARIN TIPI VADELI/VADESIZ is VADESIZ, and
2) ALACAK DEVIR HIZI PUANI is greater than or equal to 2, and
3) the measure of certainty associated with TICARI ALACAKLARIN SENETLI SENETSIZ DAGILIMI is greater than or equal to 50,
Then it is definite (100%) that SATIS TIPI,ALACAK DEVIR HIZI,TICARI ALACAKLARININ SENETLI SENETSIZ DAGILIMI FAKTORLERI HESAPLANAN ORAN > ENDUSTRI STANDARTI is 3.

RULE059 [CARI-ORAN-END>-RULES]

If 1) KISA VADELI BORCLARIN AYLARA GORE DAGILIMI is KOTU, and
2) YAKIN BIR TARIHTE BUYUK BIR ODEMESI VARMI,
Then it is definite (100%) that ALISLARIN TIPI,KISA VADELI BORCLARIN AYLARA

GORE DAGILIMI,YAKIN TARIHTE BUYUK BIR ODEME VARMI FAKTORLERI HESAPLANAN ORAN >
ENDUSTRI STANDARTI is 1.

RULE060 [CARI-ORAN-END>-RULES]

If 1) 1) KISA VADELI BORCLARIN AYLARA GORE DAGILIMI is IYI, and
2) YAKIN BIR TARIHTE BUYUK BIR ODEMESI VARMI, or
2) 1) ALISLARIN TIPI VADELI/VADESIZ is VADELI, and
2) KISA VADELI BORCLARIN AYLARA GORE DAGILIMI is KOTU, and
3) YAKIN BIR TARIHTE BUYUK BIR ODEMESI VARMI is not true,
Then it is definite (100%) that ALISLARIN TIPI,KISA VADELI BORCLARIN AYLARA
GORE DAGILIMI,YAKIN TARIHTE BUYUK BIR ODEME VARMI FAKTORLERI HESAPLANAN ORAN >
ENDUSTRI STANDARTI is 2.

RULE061 [CARI-ORAN-END>-RULES]

If 1) 1) ALISLARIN TIPI VADELI/VADESIZ is VADESIZ, and
2) YAKIN BIR TARIHTE BUYUK BIR ODEMESI VARMI is not true, or
2) 1) ALISLARIN TIPI VADELI/VADESIZ is VADELI, and
2) KISA VADELI BORCLARIN AYLARA GORE DAGILIMI is IYI, and
3) YAKIN BIR TARIHTE BUYUK BIR ODEMESI VARMI is not true,
Then it is definite (100%) that ALISLARIN TIPI,KISA VADELI BORCLARIN AYLARA
GORE DAGILIMI,YAKIN TARIHTE BUYUK BIR ODEME VARMI FAKTORLERI HESAPLANAN ORAN >
ENDUSTRI STANDARTI is 3.

RULE065 [CARI-ORAN-END>-RULES]

If DONER DEGERLER ICINDE LIKIDITESI YUKSEK OLANLARIN DIGERLERINE ORANI %
OLARAK is greater than or equal to 50,
Then it is definite (100%) that DONER DEGERLERIN LIKIDITESI YUKSEK OLANLARININ
TOPLAMA ORANI,DONER DEGERLERDE KIYMET DEGISIKLIGI OLASILIK FAKTORLERI
HESAPLANAN ORAN > ENDUSTRI STANDARTI is 3.

RULE066 [CARI-ORAN-END>-RULES]

If 1) DONER DEGERLER ICINDE LIKIDITESI YUKSEK OLANLARIN DIGERLERINE ORANI %
OLARAK is less than 50, and
2) the measure of certainty associated with DONER DEGERLERDE KIYMET
DEGISIM OLASILIGI is less than 30,
Then it is definite (100%) that DONER DEGERLERIN LIKIDITESI YUKSEK OLANLARININ
TOPLAMA ORANI,DONER DEGERLERDE KIYMET DEGISIKLIGI OLASILIK FAKTORLERI
HESAPLANAN ORAN > ENDUSTRI STANDARTI is 2.

RULE067 [CARI-ORAN-END>-RULES]

If 1) DONER DEGERLER ICINDE LIKIDITESI YUKSEK OLANLARIN DIGERLERINE ORANI %

OLARAK is less than 50, and
2) the measure of certainty associated with DONER DEGERLERDE KIYMET DEGISIM OLASILIGI is greater than or equal to 30,
Then it is definite (100%) that DONER DEGERLERIN LIKIDITESI YUKSEK OLANLARININ TOPLAMA ORANI,DONER DEGERLERDE KIYMET DEGISIKLIGI OLASILIK FAKTORLERI HESAPLANAN ORAN > ENDUSTRI STANDARTI is 1.

RULE068 [CARI-ORAN-END>-RULES]

If 1) SATISLAR MEVSIMLIK HAREKETLER GOSTERIYORMU, and
2) BILANCO MEVSIMLIK HAREKETLERIN OLDUGU DONEMDEMI HAZIRLANDI,
Then it is definite (100%) that MEVSIMLIK HAREKET,BILANCONUN 0 MEVSIMDE DUZENLENME FAKTORLERI HESAPLANAN ORAN > ENDUSTRI STANDARTI is 2.

RULE069 [CARI-ORAN-END>-RULES]

If 1) SATISLAR MEVSIMLIK HAREKETLER GOSTERIYORMU is not true, or
2) 1) SATISLAR MEVSIMLIK HAREKETLER GOSTERIYORMU, and
2) BILANCO MEVSIMLIK HAREKETLERIN OLDUGU DONEMDEMI HAZIRLANDI is not true,
Then it is definite (100%) that MEVSIMLIK HAREKET,BILANCONUN 0 MEVSIMDE DUZENLENME FAKTORLERI HESAPLANAN ORAN > ENDUSTRI STANDARTI is 3.

Rule Group CARI-ORAN-GECMIS<=-RULES

RULE011 [CARI-ORAN-GECMIS<=-RULES]

If 1) 1) NAKDEN KAR DAGITIMI VARMI, or
2) UZUN VADELI BIR BORC ODENMISMI, or
3) SABIT DEGER SATIN ALINMISMI, and
2) SERMAYE AZALTILMISMI is not true,
Then it is definite (100%) that NAKDEN KAR DAGITIMI,UZUN SURELI BORC ODENMESI,SABIT DEGER SATIN ALINMASI, SERMAYE AZALTILMASI FAKTORLERI HESAPLANAN ORAN <= GECMIS YIL is 2.

RULE012 [CARI-ORAN-GECMIS<=-RULES]

If SERMAYE AZALTILMISMI,
Then it is definite (100%) that NAKDEN KAR DAGITIMI,UZUN SURELI BORC ODENMESI,SABIT DEGER SATIN ALINMASI, SERMAYE AZALTILMASI FAKTORLERI HESAPLANAN ORAN <= GECMIS YIL is 1.

RULE013 [CARI-ORAN-GECMIS<=-RULES]

If 1) NAKDEN KAR DAGITIMI VARMI, and
2) UZUN VADELI BIR BORC ODENMISMI, and
3) SABIT DEGER SATIN ALINMISMI, and
4) SERMAYE AZALTILMISMI is not true,
Then it is definite (100%) that NAKDEN KAR DAGITIMI,UZUN SURELI BORC ODENMESI,SABIT DEGER SATIN ALINMASI, SERMAYE AZALTILMASI FAKTORLERI HESAPLANAN ORAN <= GECMIS YIL is 3.

RULE014 [CARI-ORAN-GECMIS<=-RULES]

If 1) NAKDEN KAR DAGITIMI VARMI is not true, and
2) UZUN VADELI BIR BORC ODENMISMI is not true, and
3) SABIT DEGER SATIN ALINMISMI is not true,
Then it is definite (100%) that NAKDEN KAR DAGITIMI,UZUN SURELI BORC ODENMESI,SABIT DEGER SATIN ALINMASI, SERMAYE AZALTILMASI FAKTORLERI HESAPLANAN ORAN <= GECMIS YIL is 1.

Rule Group CARI-ORAN-GECMIS>-RULES

RULE015 [CARI-ORAN-GECMIS>-RULES]

If 1) BAGLI SABIT SATISI YAPILDIMI, and
2) UZUN VADELI BIR BORC ALINDIMI, and
3) KISA VADELI BIR BORC ODENDIMI,
Then it is definite (100%) that BAGLI SABIT SATISI,UZUN SURELI BORC ALINMASI,SERMAYE ARTISI,KISA SURELI BORC ODENMESI FAKTORLERI HESAPLANAN ORAN > GECMIS YIL is 2.

RULE016 [CARI-ORAN-GECMIS>-RULES]

If 1) BAGLI SABIT SATISI YAPILDIMI, and
2) UZUN VADELI BIR BORC ALINDIMI, and
3) KISA VADELI BIR BORC ODENDIMI is not true,
Then it is definite (100%) that BAGLI SABIT SATISI,UZUN SURELI BORC ALINMASI,SERMAYE ARTISI,KISA SURELI BORC ODENMESI FAKTORLERI HESAPLANAN ORAN > GECMIS YIL is 1.

RULE017 [CARI-ORAN-GECMIS>-RULES]

If 1) 1) BAGLI SABIT SATISI YAPILDIMI, and
2) UZUN VADELI BIR BORC ALINDIMI is not true, or
2) 1) BAGLI SABIT SATISI YAPILDIMI is not true, and
2) UZUN VADELI BIR BORC ALINDIMI,
Then it is definite (100%) that BAGLI SABIT SATISI,UZUN SURELI BORC ALINMASI,SERMAYE ARTISI,KISA SURELI BORC ODENMESI FAKTORLERI HESAPLANAN ORAN > GECMIS YIL is 2.

RULE018 [CARI-ORAN-GECMIS>-RULES]

If 1) BAGLI SABIT SATISI YAPILDIMI is not true, and
2) UZUN VADELI BIR BORC ALINDIMI is not true,
Then it is definite (100%) that BAGLI SABIT SATISI,UZUN SURELI BORC ALINMASI,SERMAYE ARTISI,KISA SURELI BORC ODENMESI FAKTORLERI HESAPLANAN ORAN > GECMIS YIL is 3.

Rule Group CARI-ORAN-RULES

RULE019 [CARI-ORAN-RULES]

If KREDININ TIPI is KISA-VADELI,
Then it is definite (100%) that CARI ORAN PUANI is [[[10 times CARI ENDUTRI PUANI ETKILEYEN FAKTORLERDEN SONRA] plus [7 times CARI ORAN GECMIS YIL PUANI ETKILEYEN FAKTORLERDEN SONRA]] divided by 17].

RULE020 [CARI-ORAN-RULES]

If KREDININ TIPI is ORTA-VADELI,
Then it is definite (100%) that CARI ORAN PUANI is [[[7 times CARI ENDUTRI PUANI ETKILEYEN FAKTORLERDEN SONRA] plus [9 times CARI ORAN GECMIS YIL PUANI ETKILEYEN FAKTORLERDEN SONRA]] divided by 16].

RULE021 [CARI-ORAN-RULES]

If 1) SUPHELI ALACAK PASIFTE VARMI, or
2) STOK DEGER DUSUS PASIFTE VARMI, or
3) MENKUL DEGER DUSUS PASIFTE VARMI,
Then it is definite (100%) that DONER DEGERLER is [DONER DEGERLER minus [[SUPHELI ALACAK MIKTARI plus STOK DEGER DUSUS MIKTARI] plus MENKUL DEGER DUSUS MIKTARI]].

RULE022 [CARI-ORAN-RULES]

If [DONER DEGERLER divided by KISA VADELI BORCLAR] is greater than CARI ORANIN ENDUSTRI STANDARTI,
Then it is definite (100%) that CARI ENDUTRI PUANI ETKILEYEN FAKTORLERDEN SONRA is [[[[[[[10 times CARI ORANININ ENDUSTRI STANDARTI ILE KARSILASTIRMA PUANI] plus [6 times SATIS TIPI,ALACAK DEVIR HIZI,TICARI ALACAKLARININ SENETLI SENETSIZ DAGILIMI FAKTORLERI HESAPLANAN ORAN > ENDUSTRI STANDARTI]] plus [6 times ALISLARIN TIPI,KISA VADELI BORCLARIN AYLARA GORE DAGILIMI,YAKIN TARIHTE BUYUK BIR ODEME VARMI FAKTORLERI HESAPLANAN ORAN > ENDUSTRI STANDARTI]] plus [7 times STOK DEVIR HIZI,SATIS ISTIKRARI,PIYASA REKABETI FAKTORLERI HESAPLANAN ORAN > ENDUSTRI STANDARTI]] plus [2 times DONER DEGERLERIN LIKIDITESI YUKSEK OLANLARININ TOPLAMA ORANI,DONER DEGERLERDE KIYMET DEGISIKLIGI OLASILIK FAKTORLERI HESAPLANAN ORAN > ENDUSTRI STANDARTI]] plus [3 times MEVSIMLIK HAREKET,BILANCONUN O MEVSIMDE DUZENLENME FAKTORLERI HESAPLANAN ORAN > ENDUSTRI STANDARTI]] divided by 34].

RULE023 [CARI-ORAN-RULES]

If [DONER DEGERLER divided by KISA VADELI BORCLAR] is less than or equal to CARI ORANIN ENDUSTRI STANDARTI,
Then it is definite (100%) that CARI ENDUTRI PUANI ETKILEYEN FAKTORLERDEN SONRA is [[[[[[[10 times CARI ORANININ ENDUSTRI STANDARTI ILE KARSILASTIRMA PUANI] plus [9 times SATIS TIPI,ALACAK DEVIR HIZI,TICARI ALACAKLARININ SENETLI SENETSIZ DAGILIMI,ALACAK TAHSIL EDILEBILME OLASILIK FAKTORLERI HESAPLANAN ORAN <= ENDUSTRI STANDARTI]] plus [9 times ALISLARIN TIPI,KISA VADELI BORCLARIN AYLARA GORE DAGILIMI,TICARI BANKALARDAN KREDI KULLANMA LIMITI-BORCLARI ROFINANS ETME-BORCLARI KONSOLIDE ETME,YAKIN TARIHTE BUYUK BIR ODEME VARMI FAKTORLERI HESAPLANAN ORAN <= ENDUSTRI STANDARTI]] plus [8 times STOK DEVIR HIZI,SATIS ISTIKRARI,PIYASA REKABETI FAKTORLERI HESAPLANAN ORAN <= ENDUSTRI STANDARTI]] plus [5 times DONER DEGERLERIN LIKIDITESI YUKSEK OLANLARININ TOPLAMA ORANI,DONER DEGERLERDE KIYMET DEGISIKLIGI OLASILIK FAKTORLERI HESAPLANAN ORAN <= ENDUSTRI STANDARTI]] plus [3 times MEVSIMLIK HAREKET,BILANCONUN O MEVSIMDE DUZENLENME FAKTORLERI HESAPLANAN ORAN <= ENDUSTRI STANDARTI]] divided by 44].

RULE024 [CARI-ORAN-RULES]

If [DONER DEGERLER divided by KISA VADELI BORCLAR] is greater than CARI ORANIN ENDUSTRI STANDARTI,
Then it is definite (100%) that CARI ORANININ ENDUSTRI STANDARTI ILE KARSILASTIRMA PUANI is 3.

RULE025 [CARI-ORAN-RULES]

If [DONER DEGERLER divided by KISA VADELI BORCLAR] is less than CARI ORANIN ENDUSTRI STANDARTI,
Then it is definite (100%) that CARI ORANININ ENDUSTRI STANDARTI ILE

KARSILASTIRMA PUANI is 1.

RULE028 [CARI-ORAN-RULES]

If [DONER DEGERLER divided by KISA VADELI BORCLAR] is less than or equal to GECMIS YIL CARI ORANI,
Then it is definite (100%) that CARI ORAN GECMIS YIL PUANI ETKILEYEN FAKTORLERDEN SONRA is [[[10 times CARI ORANIN GECMIS YILKI ILE KARSILASTIRMA PUANI] plus [6 times NAKDEN KAR DAGITIMI,UZUN SURELI BORC ODENMESI,SABIT DEGER SATIN ALINMASI, SERMAYE AZALTILMASI FAKTORLERI HESAPLANAN ORAN <= GECMIS YIL]] divided by 16].

RULE029 [CARI-ORAN-RULES]

If [DONER DEGERLER divided by KISA VADELI BORCLAR] is greater than GECMIS YIL CARI ORANI,
Then it is definite (100%) that CARI ORAN GECMIS YIL PUANI ETKILEYEN FAKTORLERDEN SONRA is [[[10 times CARI ORANIN GECMIS YILKI ILE KARSILASTIRMA PUANI] plus [4 times BAGLI SABIT SATISI,UZUN SURELI BORC ALINMASI,SERMAYE ARTISI,KISA SURELI BORC ODENMESI FAKTORLERI HESAPLANAN ORAN > GECMIS YIL]] divided by 14].

RULE031 [CARI-ORAN-RULES]

If [DONER DEGERLER divided by KISA VADELI BORCLAR] is greater than GECMIS YIL CARI ORANI,
Then it is definite (100%) that CARI ORANIN GECMIS YILKI ILE KARSILASTIRMA PUANI is 3.

RULE032 [CARI-ORAN-RULES]

If [DONER DEGERLER divided by KISA VADELI BORCLAR] is less than GECMIS YIL CARI ORANI,
Then it is definite (100%) that CARI ORANIN GECMIS YILKI ILE KARSILASTIRMA PUANI is 1.

Rule Group FAALIYET-KARI-END-RULES

RULE213 [FAALIYET-KARI-END-RULES]

If OZ SERMAYE DEVIR HIZI PUANI is greater than 2,

Then it is definite (100%) that OZ SERMAYE DEVIR HIZ FAKTORU is 3.

RULE214 [FAALIYET-KARI-END-RULES]

If OZ SERMAYE DEVIR HIZI PUANI is less than 2,
Then it is definite (100%) that OZ SERMAYE DEVIR HIZ FAKTORU is 1.

RULE215 [FAALIYET-KARI-END-RULES]

If 1) SATIS FIYATINDA ARTIS VAR, and
2) SATILAN MAL MALIYETINDE AZALMA VAR,
Then it is definite (100%) that SATIS FIYATINDAKI ARTIS,SATILAN MAL MALIYETINDEKI AZALIS,SATILAN MAL BILESIMDEKI DEGISIM FAKTORLERI is 2.

RULE216 [FAALIYET-KARI-END-RULES]

If 1) SATIS FIYATINDA ARTIS VAR, and
2) SATILAN MAL MALIYETINDE AZALMA VAR is not true,
Then it is definite (100%) that SATIS FIYATINDAKI ARTIS,SATILAN MAL MALIYETINDEKI AZALIS,SATILAN MAL BILESIMDEKI DEGISIM FAKTORLERI is 1.

RULE217 [FAALIYET-KARI-END-RULES]

If 1) SATIS FIYATINDA ARTIS VAR is not true, and
2) SATILAN MAL BILESIMINDE DEGISIM VAR,
Then it is definite (100%) that SATIS FIYATINDAKI ARTIS,SATILAN MAL MALIYETINDEKI AZALIS,SATILAN MAL BILESIMDEKI DEGISIM FAKTORLERI is 2.

RULE218 [FAALIYET-KARI-END-RULES]

If 1) SATIS FIYATINDA ARTIS VAR is not true, and
2) SATILAN MAL BILESIMINDE DEGISIM VAR is not true,
Then it is definite (100%) that SATIS FIYATINDAKI ARTIS,SATILAN MAL MALIYETINDEKI AZALIS,SATILAN MAL BILESIMDEKI DEGISIM FAKTORLERI is 3.

Rule Group FAALIYET-KARI-RULES

RULE205 [FAALIYET-KARI-RULES]

If KREDININ TIPI is KISA-VADELI,

Then it is definite (100%) that FAALIYET KARI PUANI is [[[[6 times FAALIYET KAR PUANI END. STANDARTINA GORE ETKILEYEN FAKTORLERDEN SONRA] plus [10 times FAALIYET KAR PUANI GECMIS YILA GORE]] plus [3 times SATIS FIYATINDAKI ARTIS,SATILAN MAL MALIYETINDEKI AZALIS,SATILAN MAL BILESIMDEKI DEGISIM FAKTORLERI]] divided by 19].

RULE206 [FAALIYET-KARI-RULES]

If KREDININ TIPI is ORTA-VADELI,
Then it is definite (100%) that FAALIYET KARI PUANI is [[[[4 times FAALIYET KAR PUANI END. STANDARTINA GORE ETKILEYEN FAKTORLERDEN SONRA] plus [10 times FAALIYET KAR PUANI GECMIS YILA GORE]] plus [2 times SATIS FIYATINDAKI ARTIS,SATILAN MAL MALIYETINDEKI AZALIS,SATILAN MAL BILESIMDEKI DEGISIM FAKTORLERI]] divided by 16].

RULE207 [FAALIYET-KARI-RULES]

If [FAALIYET KARI divided by NET SATISLAR] is greater than or equal to FAALIYET KARI END. STANDARTI,
Then it is definite (100%) that FAALIYET KAR PUANI END. STANDARTINA GORE ETKILEYEN FAKTORLERDEN SONRA is [[[10 times FAALIYE KAR PUANI END. STANDARTINA GORE] plus [8 times OZ SERMAYE DEVIR HIZ FAKTORU]] divided by 18].

RULE208 [FAALIYET-KARI-RULES]

If [FAALIYET KARI divided by NET SATISLAR] is less than FAALIYET KARI END. STANDARTI,
Then it is definite (100%) that FAALIYET KAR PUANI END. STANDARTINA GORE ETKILEYEN FAKTORLERDEN SONRA is [[[8 times FAALIYE KAR PUANI END. STANDARTINA GORE] plus [9 times OZ SERMAYE DEVIR HIZ FAKTORU]] divided by 19].

RULE209 [FAALIYET-KARI-RULES]

If [FAALIYET KARI divided by NET SATISLAR] is greater than FAALIYET KARI END. STANDARTI,
Then it is definite (100%) that FAALIYE KAR PUANI END. STANDARTINA GORE is 3.

RULE210 [FAALIYET-KARI-RULES]

If [FAALIYET KARI divided by NET SATISLAR] is less than FAALIYET KARI END. STANDARTI,
Then it is definite (100%) that FAALIYE KAR PUANI END. STANDARTINA GORE is 1.

RULE211 [FAALIYET-KARI-RULES]

If [FAALIYET KARI divided by NET SATISLAR] is greater than GECMIS YIL FAALIYET KARI ORANI,
Then it is definite (100%) that FAALIYET KAR PUANI GECMIS YILA GORE is 3.

RULE212 [FAALIYET-KARI-RULES]

If [FAALIYET KARI divided by NET SATISLAR] is less than GECMIS YIL FAALIYET KARI ORANI,
Then it is definite (100%) that FAALIYET KAR PUANI GECMIS YILA GORE is 1.

Rule Group FVOK-AKTIFLER-RULES

RULE174 [FVOK-AKTIFLER-RULES]

If KREDININ TIPI is KISA-VADELI,
Then it is definite (100%) that FVOK / AKTIF PUANI is [[[9 times FVOK END. STANDART PUANI] plus [7 times FVOK GECMIS YIL PUANI]] divided by 16].

RULE175 [FVOK-AKTIFLER-RULES]

If KREDININ TIPI is ORTA-VADELI,
Then it is definite (100%) that FVOK / AKTIF PUANI is [[[8 times FVOK END. STANDART PUANI] plus [9 times FVOK GECMIS YIL PUANI]] divided by 17].

RULE176 [FVOK-AKTIFLER-RULES]

If 1) [FAIZ VERGIDEN ONCEKI KAZANC divided by AKTIFLERIN TOPLAMI] is greater than FVOK END. STANDARTI, and
2) KAR DAGITIM POLITIKASI is IYI,
Then it is definite (100%) that FVOK END. STANDART PUANI is 3.

RULE177 [FVOK-AKTIFLER-RULES]

If 1) 1) [FAIZ VERGIDEN ONCEKI KAZANC divided by AKTIFLERIN TOPLAMI] is greater than FVOK END. STANDARTI, and
2) KAR DAGITIM POLITIKASI is KOTU, or
2) 1) [FAIZ VERGIDEN ONCEKI KAZANC divided by AKTIFLERIN TOPLAMI] is less than or equal to FVOK END. STANDARTI, and
2) KAR DAGITIM POLITIKASI is IYI,
Then it is definite (100%) that FVOK END. STANDART PUANI is 2.

RULE178 [FVOK-AKTIFLER-RULES]

If 1) [FAIZ VERGIDEN ONCEKI KAZANC divided by AKTIFLERIN TOPLAMI] is less than or equal to FVOK END. STANDARTI, and
2) KAR DAGITIM POLITIKASI is KOTU,
Then it is definite (100%) that FVOK END. STANDART PUANI is 1.

RULE179 [FVOK-AKTIFLER-RULES]

If [FAIZ VERGIDEN ONCEKI KAZANC divided by AKTIFLERIN TOPLAMI] is less than FVOK GECMIS YIL ORANI,
Then it is definite (100%) that FVOK GECMIS YIL PUANI is 1.

RULE180 [FVOK-AKTIFLER-RULES]

If [FAIZ VERGIDEN ONCEKI KAZANC divided by AKTIFLERIN TOPLAMI] is greater than FVOK GECMIS YIL ORANI,
Then it is definite (100%) that FVOK GECMIS YIL PUANI is 3.

Rule Group KISAVADBORC-AKTIFLER-RULES

RULE158 [KISAVADBORC-AKTIFLER-RULES]

If KREDININ TIPI is KISA-VADELI,
Then it is definite (100%) that KISA VADELI BORCLAR / AKTIF TOPLAMI PUANI is [[[9 times KISA VADELI BORCLAR AKTIF TOPLAMI PUANI END. STANDARTINA GORE] plus [8 times KISA VADELI BORCLAR AKTIF TOPLAMI PUANI GECMIS YILA GORE]] divided by 17].

RULE159 [KISAVADBORC-AKTIFLER-RULES]

If KREDININ TIPI is ORTA-VADELI,
Then it is definite (100%) that KISA VADELI BORCLAR / AKTIF TOPLAMI PUANI is [[[6 times KISA VADELI BORCLAR AKTIF TOPLAMI PUANI END. STANDARTINA GORE] plus [9 times KISA VADELI BORCLAR AKTIF TOPLAMI PUANI GECMIS YILA GORE]] divided by 15].

RULE160 [KISAVADBORC-AKTIFLER-RULES]

If [KISA VADELI BORCLAR divided by AKTIFLERIN TOPLAMI] is less than [1. divided by 3.],

Then it is definite (100%) that KISA VADELI BORCLAR AKTIF TOPLAMI PUANI END.
STANDARTINA GORE is 3.

RULE161 [KISAVADBORC-AKTIFLER-RULES]

If 1) [KISA VADELI BORCLAR divided by AKTIFLERIN TOPLAMI] is greater than [1. divided by 3.], and
2) FIRMA KURULUS ZAMANI is YENI,
Then it is definite (100%) that KISA VADELI BORCLAR AKTIF TOPLAMI PUANI END.
STANDARTINA GORE is 2.

RULE162 [KISAVADBORC-AKTIFLER-RULES]

If 1) [KISA VADELI BORCLAR divided by AKTIFLERIN TOPLAMI] is greater than [1. divided by 3.], and
2) FIRMA KURULUS ZAMANI is ESKI,
Then it is definite (100%) that KISA VADELI BORCLAR AKTIF TOPLAMI PUANI END.
STANDARTINA GORE is 1.

RULE163 [KISAVADBORC-AKTIFLER-RULES]

If [KISA VADELI BORCLAR divided by AKTIFLERIN TOPLAMI] is less than KISA VADELI BORCLAR AKTIF TOPLAMI GECMIS YIL ORANI,
Then it is definite (100%) that KISA VADELI BORCLAR AKTIF TOPLAMI PUANI GECMIS YILA GORE is 3.

RULE164 [KISAVADBORC-AKTIFLER-RULES]

If [KISA VADELI BORCLAR divided by AKTIFLERIN TOPLAMI] is greater than KISA VADELI BORCLAR AKTIF TOPLAMI GECMIS YIL ORANI,
Then it is definite (100%) that KISA VADELI BORCLAR AKTIF TOPLAMI PUANI GECMIS YILA GORE is 1.

Rule Group KREDI-ANALIZ-ROOT-RULES

RULE001 [KREDI-ANALIZ-ROOT-RULES]

If KREDININ TIPI is ORTA-VADELI,
Then it is definite (100%) that FIRMANIN TOPLAM PUANI is [[[[[6 times LIKIDITE DURUM PUANI] plus [5 times AKTIVITE DURUM PUANI]] plus [10 times MALI YAPI PUANI]] plus [8 times KARLILIK PUANI]] divided by 29].

RULE002 [KREDI-ANALIZ-ROOT-RULES]

If KREDININ TIPI is KISA-VADELI,
Then it is definite (100%) that FIRMANIN TOPLAM PUANI is [[[[[10 times LIKIDITE DURUM PUANI] plus [9 times AKTIVITE DURUM PUANI]] plus [7 times MALI YAPI PUANI]] plus [9 times KARLILIK PUANI]] divided by 35].

RULE003 [KREDI-ANALIZ-ROOT-RULES]

If KREDININ TIPI is ORTA-VADELI,
Then it is definite (100%) that LIKIDITE DURUM PUANI is [[[8 times CARI ORAN PUANI] plus [9 times LIKIDITE ORAN PUANI]] divided by 17].

RULE004 [KREDI-ANALIZ-ROOT-RULES]

If KREDININ TIPI is KISA-VADELI,
Then it is definite (100%) that LIKIDITE DURUM PUANI is [[[7 times CARI ORAN PUANI] plus [10 times LIKIDITE ORAN PUANI]] divided by 17].

RULE005 [KREDI-ANALIZ-ROOT-RULES]

If KREDININ TIPI is ORTA-VADELI,
Then it is definite (100%) that AKTIVITE DURUM PUANI is [[[[[7 times ALACAK DEVIR HIZI PUANI] plus [6 times STOK DEVIR HIZI PUANI]] plus [10 times OZ SERMAYE DEVIR HIZI PUANI]] plus [8 times AKTIF DEVIR HIZI PUANI]] divided by 31].

RULE006 [KREDI-ANALIZ-ROOT-RULES]

If KREDININ TIPI is KISA-VADELI,
Then it is definite (100%) that AKTIVITE DURUM PUANI is [[[[[10 times ALACAK DEVIR HIZI PUANI] plus [9 times STOK DEVIR HIZI PUANI]] plus [6 times OZ SERMAYE DEVIR HIZI PUANI]] plus [7 times AKTIF DEVIR HIZI PUANI]] divided by 32].

RULE007 [KREDI-ANALIZ-ROOT-RULES]

If KREDININ TIPI is ORTA-VADELI,
Then it is definite (100%) that KARLILIK PUANI is [[[[[[[7 times FVOK / AKTIF PUANI] plus [6 times BRUT SATIS KARI / NET SATISLAR]] plus [8 times FAALIYET KARI PUANI]] plus [10 times BILANCO KARI / NET SATISLAR]] plus [9 times NET KAR / NET SATISLAR]] plus [9 times NET KAR / OZ SERMAYE ORANI PUANI]] divided by 49].

RULE008 [KREDI-ANALIZ-ROOT-RULES]

If KREDININ TIPI is KISA-VADELI,
Then it is definite (100%) that KARLILIK PUANI is [[[[[[[5 times FVOK / AKTIF PUANI] plus [3 times BRUT SATIS KARI / NET SATISLAR]] plus [7 times FAALIYET KARI PUANI]] plus [8 times BILANCO KARI / NET SATISLAR]] plus [9 times NET KAR / NET SATISLAR]] plus [9 times NET KAR / OZ SERMAYE ORANI PUANI]] divided by 41].

RULE009 [KREDI-ANALIZ-ROOT-RULES]

If KREDININ TIPI is ORTA-VADELI,
Then it is definite (100%) that MALI YAPI PUANI is [[[[[7 times BORCLAR / MADDI OZ SERMAYE PUANI] plus [10 times MADDI SABIT DEGERLER / MADDI OZ SERMAYE PUANI]] plus [4 times KISA VADELI BORCLAR / AKTIF TOPLAMI PUANI]] plus [5 times BORCLAR / AKTIF TOPLAMI PUANI]] divided by 26].

RULE010 [KREDI-ANALIZ-ROOT-RULES]

If KREDININ TIPI is KISA-VADELI,
Then it is definite (100%) that MALI YAPI PUANI is [[[[[7 times BORCLAR / MADDI OZ SERMAYE PUANI] plus [4 times MADDI SABIT DEGERLER / MADDI OZ SERMAYE PUANI]] plus [10 times KISA VADELI BORCLAR / AKTIF TOPLAMI PUANI]] plus [8 times BORCLAR / AKTIF TOPLAMI PUANI]] divided by 29].

Rule Group LIKIDITE-ORAN-RULES

RULE072 [LIKIDITE-ORAN-RULES]

If KREDININ TIPI is KISA-VADELI,
Then it is definite (100%) that LIKIDITE ORAN PUANI is [[[9 times ENDUSTRI STANDARTLARINA GORE LIKIDITE ORAN PUANI] plus [7 times GECMIS YILA GORE LIKIDITE ORAN PUANI]] divided by 16].

RULE073 [LIKIDITE-ORAN-RULES]

If KREDININ TIPI is ORTA-VADELI,
Then it is definite (100%) that LIKIDITE ORAN PUANI is [[[6 times ENDUSTRI STANDARTLARINA GORE LIKIDITE ORAN PUANI] plus [9 times GECMIS YILA GORE LIKIDITE ORAN PUANI]] divided by 15].

RULE074 [LIKIDITE-ORAN-RULES]

If 1) SUPHELI ALACAK PASIFTE VARMI, or
2) PESIN GIDER VARMI, or
3) 1) 1) FIRMA TIPI is TEK-SAHIPLI, or
2) FIRMA TIPI is ADI-ORTAKLIK, or
3) FIRMA TIPI is SAHIS-SIRKETI, and
2) FIRMANIN SAHIBINDEN ALACAGI, or
4) SATICI AVANSI, or
5) MUBAYA AVANSI,
Then it is definite (100%) that ALACAKLAR is [ALACAKLAR minus [[[[SUPHELI ALACAK MIKTARI plus PESIN GIDER MIKTARI] plus FIRMA SAHIBINDEN ALACAK MIKTARI] plus SATICI AVANS MIKTARI] plus MUBAYA AVANS MIKTARI]].

RULE075 [LIKIDITE-ORAN-RULES]

If [[[[KASA plus BANKALAR] plus TAHVILLER] plus ALACAKLAR] divided by KISA VADELI BORCLAR] is greater than LIKIDITE ORANININ ENDUSTRI STANDARTI,
Then it is definite (100%) that ENDUSTRI STANDARTLARINA GORE LIKIDITE ORAN PUANI is 3.

RULE076 [LIKIDITE-ORAN-RULES]

If [[[[KASA plus BANKALAR] plus TAHVILLER] plus ALACAKLAR] divided by KISA VADELI BORCLAR] is less than LIKIDITE ORANININ ENDUSTRI STANDARTI,
Then it is definite (100%) that ENDUSTRI STANDARTLARINA GORE LIKIDITE ORAN PUANI is 1.

RULE078 [LIKIDITE-ORAN-RULES]

If [[[[KASA plus BANKALAR] plus TAHVILLER] plus ALACAKLAR] divided by KISA VADELI BORCLAR] is greater than GECMIS YIL LIKIDITE ORANI,
Then it is definite (100%) that GECMIS YILA GORE LIKIDITE ORAN PUANI is 3.

RULE079 [LIKIDITE-ORAN-RULES]

If [[[[KASA plus BANKALAR] plus TAHVILLER] plus ALACAKLAR] divided by KISA VADELI BORCLAR] is less than GECMIS YIL LIKIDITE ORANI,
Then it is definite (100%) that GECMIS YILA GORE LIKIDITE ORAN PUANI is 1.

Rule Group MADDI-SABITLER-RULES

RULE152 [MADDI-SABITLER-RULES]

If KREDININ TIPI is KISA-VADELI,
Then it is definite (100%) that MADDI SABIT DEGERLER / MADDI OZ SERMAYE PUANI is [[[10 times MADDI SABIT DEGERLER MADDI OZSERMAYE PUANI END. STANDARTINA GORE] plus [8 times MADDI SABIT DEGERLER MADDI OZSERMAYE PUANI GECMIS YILA GORE]] divided by 18].

RULE153 [MADDI-SABITLER-RULES]

If KREDININ TIPI is ORTA-VADELI,
Then it is definite (100%) that MADDI SABIT DEGERLER / MADDI OZ SERMAYE PUANI is [[[6 times MADDI SABIT DEGERLER MADDI OZSERMAYE PUANI END. STANDARTINA GORE] plus [9 times MADDI SABIT DEGERLER MADDI OZSERMAYE PUANI GECMIS YILA GORE]] divided by 15].

RULE154 [MADDI-SABITLER-RULES]

If [MADDI SABIT DEGERLER divided by MADDI OZSERMAYE] is less than GECMIS YIL MADDI SABIT DEGERLER MADDI OZSERMAYE ORANI,
Then it is definite (100%) that MADDI SABIT DEGERLER MADDI OZSERMAYE PUANI GECMIS YILA GORE is 3.

RULE155 [MADDI-SABITLER-RULES]

If [MADDI SABIT DEGERLER divided by MADDI OZSERMAYE] is greater than GECMIS YIL MADDI SABIT DEGERLER MADDI OZSERMAYE ORANI,
Then it is definite (100%) that MADDI SABIT DEGERLER MADDI OZSERMAYE PUANI GECMIS YILA GORE is 1.

RULE156 [MADDI-SABITLER-RULES]

If [MADDI SABIT DEGERLER divided by MADDI OZSERMAYE] is less than 1.,
Then it is definite (100%) that MADDI SABIT DEGERLER MADDI OZSERMAYE PUANI END. STANDARTINA GORE is 3.

RULE157 [MADDI-SABITLER-RULES]

If 1) [MADDI SABIT DEGERLER divided by MADDI OZSERMAYE] is greater than 1.,
and
2) MADDI SABIT DEGER SATIN ALIYOR is not true,

Then it is definite (100%) that MADDI SABIT DEGERLER MADDI OZSERMAYE PUANI END. STANDARTINA GORE is 1..

Rule Group NETKAR-NETSATISLAR-RULES

RULE187 [NETKAR-NETSATISLAR-RULES]

If KREDININ TIPI is KISA-VADELI,
Then it is definite (100%) that NET KAR / NET SATISLAR is [[[4 times NET KAR ORANI PUANI END. STANDARTINA GORE] plus [10 times NET KAR ORAN PUANI GECMIS YILA GORE]] divided by 14].

RULE188 [NETKAR-NETSATISLAR-RULES]

If KREDININ TIPI is ORTA-VADELI,
Then it is definite (100%) that NET KAR / NET SATISLAR is [[[3 times NET KAR ORANI PUANI END. STANDARTINA GORE] plus [10 times NET KAR ORAN PUANI GECMIS YILA GORE]] divided by 13].

RULE189 [NETKAR-NETSATISLAR-RULES]

If [NET KAR divided by NET SATISLAR] is greater than NET KAR NET SATISLAR ORANI END. STANDARTINA GORE,
Then it is definite (100%) that NET KAR ORANI PUANI END. STANDARTINA GORE is 3.

RULE190 [NETKAR-NETSATISLAR-RULES]

If [NET KAR divided by NET SATISLAR] is less than NET KAR NET SATISLAR ORANI END. STANDARTINA GORE,
Then it is definite (100%) that NET KAR ORANI PUANI END. STANDARTINA GORE is 1.

RULE191 [NETKAR-NETSATISLAR-RULES]

If [NET KAR divided by NET SATISLAR] is greater than NET KAR NET SATISLAR ORANI GECMIS YILA GORE,
Then it is definite (100%) that NET KAR ORAN PUANI GECMIS YILA GORE is 3.

RULE192 [NETKAR-NETSATISLAR-RULES]

If [NET KAR divided by NET SATISLAR] is less than NET KAR NET SATISLAR ORANI

GECMIS YILA GORE,
Then it is definite (100%) that NET KAR ORAN PUANI GECMIS YILA GORE is 1.

Rule Group NETKAR-OZSER-RULES

RULE199 [NETKAR-OZSER-RULES]

If KREDININ TIPI is KISA-VADELI,
Then it is definite (100%) that NET KAR / OZ SERMAYE ORANI PUANI is [[[7 times NET KAR OZ SERMAYE ORANI PUANI END. STANDARTINA GORE] plus [10 times NET KAR OZ SERMAYE ORAN PUANI GECMIS YILA GORE]] divided by 17].

RULE200 [NETKAR-OZSER-RULES]

If KREDININ TIPI is ORTA-VADELI,
Then it is definite (100%) that NET KAR / OZ SERMAYE ORANI PUANI is [[[6 times NET KAR OZ SERMAYE ORANI PUANI END. STANDARTINA GORE] plus [10 times NET KAR OZ SERMAYE ORAN PUANI GECMIS YILA GORE]] divided by 16].

RULE201 [NETKAR-OZSER-RULES]

If [NET KAR divided by OZ SERMAYE] is greater than NET KAR OZ SERMAYE END. STANDARTI,
Then it is definite (100%) that NET KAR OZ SERMAYE ORANI PUANI END. STANDARTINA GORE is 3.

RULE202 [NETKAR-OZSER-RULES]

If [NET KAR divided by OZ SERMAYE] is less than NET KAR OZ SERMAYE END. STANDARTI,
Then it is definite (100%) that NET KAR OZ SERMAYE ORANI PUANI END. STANDARTINA GORE is 1.

RULE203 [NETKAR-OZSER-RULES]

If [NET KAR divided by OZ SERMAYE] is greater than NET KAR OZ SERMAYE ORANI GECMIS YILA GORE,
Then it is definite (100%) that NET KAR OZ SERMAYE ORAN PUANI GECMIS YILA GORE is 3.

RULE204 [NETKAR-OZSER-RULES]

If [NET KAR divided by OZ SERMAYE] is less than NET KAR OZ SERMAYE ORANI GECMIS YILA GORE,
Then it is definite (100%) that NET KAR OZ SERMAYE ORAN PUANI GECMIS YILA GORE is 1.

Rule Group ODHP-END-RULES

RULE126 [ODHP-END-RULES]

If 1) STOK DEVIR HIZI PUANI ENDUSTRI STANDARTINA GORE is less than 2, and
2) ALACAK DEVIR HIZI PUANI is less than 2, and
3) FIRMA KURULUS ZAMANI is YENI,
Then it is definite (100%) that STOK DEVIR HIZI,ALACAK DEVIR HIZI,FIRMANIN KURULUS ZAMANI FAKTORLERI is 1.

RULE127 [ODHP-END-RULES]

If 1) STOK DEVIR HIZI PUANI ENDUSTRI STANDARTINA GORE is greater than or equal to 2, and
2) ALACAK DEVIR HIZI PUANI is greater than or equal to 2,
Then it is definite (100%) that STOK DEVIR HIZI,ALACAK DEVIR HIZI,FIRMANIN KURULUS ZAMANI FAKTORLERI is 3.

RULE128 [ODHP-END-RULES]

If 1) 1) STOK DEVIR HIZI PUANI ENDUSTRI STANDARTINA GORE is greater than or equal to 2, and
2) ALACAK DEVIR HIZI PUANI is less than 2, or
2) 1) STOK DEVIR HIZI PUANI ENDUSTRI STANDARTINA GORE is less than 2, and
2) ALACAK DEVIR HIZI PUANI is greater than or equal to 2,
Then it is definite (100%) that STOK DEVIR HIZI,ALACAK DEVIR HIZI,FIRMANIN KURULUS ZAMANI FAKTORLERI is 2.

RULE129 [ODHP-END-RULES]

If 1) STOK DEVIR HIZI PUANI ENDUSTRI STANDARTINA GORE is less than 2, and
2) ALACAK DEVIR HIZI PUANI is less than 2, and
3) FIRMA KURULUS ZAMANI is ESKI,
Then it is definite (100%) that STOK DEVIR HIZI,ALACAK DEVIR HIZI,FIRMANIN

KURULUS ZAMANI FAKTORLERI is 2.

Rule Group OZSERMAYE-DEVIR-HIZI-RULES

RULE118 [OZSERMAYE-DEVIR-HIZI-RULES]

If KREDININ TIPI is KISA-VADELI,
Then it is definite (100%) that OZ SERMAYE DEVIR HIZI PUANI is [[[[[9 times OZSERMAYE DEVIR HIZININ ENDUSTRI STANDARTINA GORE PUANI ETKILEYEN FAKTORLERDEN SONRA] plus [8 times OZSERMAYE DEVIR HIZININ GECMIS YILA GORE PUANI]] plus [5 times MADDI SABIT DEGERLER / MADDI OZ SERMAYE PUANI]] plus [5 times BORCLAR / MADDI OZ SERMAYE PUANI]] divided by 27].

RULE119 [OZSERMAYE-DEVIR-HIZI-RULES]

If KREDININ TIPI is ORTA-VADELI,
Then it is definite (100%) that OZ SERMAYE DEVIR HIZI PUANI is [[[[[7 times OZSERMAYE DEVIR HIZININ ENDUSTRI STANDARTINA GORE PUANI ETKILEYEN FAKTORLERDEN SONRA] plus [9 times OZSERMAYE DEVIR HIZININ GECMIS YILA GORE PUANI]] plus [6 times MADDI SABIT DEGERLER / MADDI OZ SERMAYE PUANI]] plus [6 times BORCLAR / MADDI OZ SERMAYE PUANI]] divided by 28].

RULE120 [OZSERMAYE-DEVIR-HIZI-RULES]

If [NET SATISLAR divided by ORTALAMA OZSERMAYE] is greater than GECMIS YIL OZSERMAYE DEVIR HIZI,
Then it is definite (100%) that OZSERMAYE DEVIR HIZININ GECMIS YILA GORE PUANI is 3.

RULE121 [OZSERMAYE-DEVIR-HIZI-RULES]

If [NET SATISLAR divided by ORTALAMA OZSERMAYE] is less than GECMIS YIL OZSERMAYE DEVIR HIZI,
Then it is definite (100%) that OZSERMAYE DEVIR HIZININ GECMIS YILA GORE PUANI is 1.

RULE122 [OZSERMAYE-DEVIR-HIZI-RULES]

If [NET SATISLAR divided by ORTALAMA OZSERMAYE] is greater than or equal to OZSERMAYE DEVIR HIZININ ENDUSTRI STANDARTI,
Then it is definite (100%) that OZSERMAYE DEVIR HIZININ ENDUSTRI STANDARTINA

GORE PUANI ETKILEYEN FAKTORLERDEN SONRA is [[[10 times OZSERMAYE DEVIR HIZININ ENDUSTRI STANDARTINA GORE PUANI] plus [7 times STOK DEVIR HIZI,ALACAK DEVIR HIZI,FIRMANIN KURULUS ZAMANI FAKTORLERI]] divided by 17].

RULE123 [OZSERMAYE-DEVIR-HIZI-RULES]

If [NET SATISLAR divided by ORTALAMA OZSERMAYE] is less than OZSERMAYE DEVIR HIZININ ENDUSTRI STANDARTI,
Then it is definite (100%) that OZSERMAYE DEVIR HIZININ ENDUSTRI STANDARTINA GORE PUANI ETKILEYEN FAKTORLERDEN SONRA is [[[10 times OZSERMAYE DEVIR HIZININ ENDUSTRI STANDARTINA GORE PUANI] plus [9 times STOK DEVIR HIZI,ALACAK DEVIR HIZI,FIRMANIN KURULUS ZAMANI FAKTORLERI]] divided by 19].

RULE124 [OZSERMAYE-DEVIR-HIZI-RULES]

If [NET SATISLAR divided by ORTALAMA OZSERMAYE] is greater than OZSERMAYE DEVIR HIZININ ENDUSTRI STANDARTI,
Then it is definite (100%) that OZSERMAYE DEVIR HIZININ ENDUSTRI STANDARTINA GORE PUANI is 3.

RULE125 [OZSERMAYE-DEVIR-HIZI-RULES]

If [NET SATISLAR divided by ORTALAMA OZSERMAYE] is less than OZSERMAYE DEVIR HIZININ ENDUSTRI STANDARTI,
Then it is definite (100%) that OZSERMAYE DEVIR HIZININ ENDUSTRI STANDARTINA GORE PUANI is 1.

Rule Group SDH-END<-RULES

RULE113 [SDH-END<-RULES]

If 1) STOK KALITESI is KOTU, or
2) 1) STOK KALITESI is IYI, and
2) EMNIYET STOGU is DUSUK, and
3) STOKLARA YATIRIM is AZ,
Then it is definite (100%) that STOK KALITESI,EMNIYET STOGU,STOKLARA YATIRIM POLITIKASI FAKTORLERI SDH < END. STANDARTI is 1.

RULE114 [SDH-END<-RULES]

If 1) 1) STOK KALITESI is IYI, and

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         2) EMNIYET STOGU is YUKSEK, or
     2) 1) STOK KALITESI is IYI, and
         2) EMNIYET STOGU is DUSUK, and
         3) STOKLARA YATIRIM is COK,
Then it is definite (100%) that STOK KALITESI,EMNIYET STOGU,STOKLARA YATIRIM
POLITIKASI FAKTORLERI SDH < END. STANDARTI is 3.


RULE115 [SDH-END<-RULES]
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If   FIRMANIN PIYASA REKABETI is GUCLU,
Then it is definite (100%) that REKABET,TUKETICI ZEVKLERINDE DEGISIM
FAKTORLERI SDH < END. STANDARTI is 3.


RULE116 [SDH-END<-RULES]
-------
If   1) FIRMANIN PIYASA REKABETI is GUCSUZ, and
     2) TUKETICI ZEVK DEGISIMI is YOK,
Then it is definite (100%) that REKABET,TUKETICI ZEVKLERINDE DEGISIM
FAKTORLERI SDH < END. STANDARTI is 2.


RULE117 [SDH-END<-RULES]
-------
If   1) FIRMANIN PIYASA REKABETI is GUCSUZ, and
     2) TUKETICI ZEVK DEGISIMI is VAR,
Then it is definite (100%) that REKABET,TUKETICI ZEVKLERINDE DEGISIM
FAKTORLERI SDH < END. STANDARTI is 1.



     Rule Group SDH-END>=-RULES



RULE105 [SDH-END>=-RULES]
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If   1) FAALIYET KARI PUANI is less than 2, and
     2) BRUT SATIS KARI / NET SATISLAR is less than 2, and
     3) BILANCO KARI / NET SATISLAR is less than 2,
Then it is definite (100%) that FAALIYET KAR PUANI,BRUT SATIS KAR
PUANI,BILANCO KAR PUANI NET KAR PUANI FAKTORLERI SDH >= END. STANDARTI is 1.


RULE106 [SDH-END>=-RULES]
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If   1) 1) FAALIYET KARI PUANI is less than 2, and
         2) BRUT SATIS KARI / NET SATISLAR is greater than or equal to 2, and
         3) BILANCO KARI / NET SATISLAR is less than 2, or
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     2) 1) FAALIYET KARI PUANI is less than 2, and
        2) BRUT SATIS KARI / NET SATISLAR is less than 2, and
        3) BILANCO KARI / NET SATISLAR is greater than or equal to 2,
Then it is definite (100%) that FAALIYET KAR PUANI,BRUT SATIS KAR
PUANI,BILANCO KAR PUANI NET KAR PUANI FAKTORLERI SDH >= END. STANDARTI is 2.


RULE107 [SDH-END>=-RULES]
-------
If   1) 1) FAALIYET KARI PUANI is greater than or equal to 2, and
        2) BRUT SATIS KARI / NET SATISLAR is greater than or equal to 2, or
     2) 1) FAALIYET KARI PUANI is greater than or equal to 2, and
        2) BRUT SATIS KARI / NET SATISLAR is less than 2, and
        3) BILANCO KARI / NET SATISLAR is greater than or equal to 2,
Then it is definite (100%) that FAALIYET KAR PUANI,BRUT SATIS KAR
PUANI,BILANCO KAR PUANI NET KAR PUANI FAKTORLERI SDH >= END. STANDARTI is 3.


RULE108 [SDH-END>=-RULES]
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If   1) FAALIYET KARI PUANI is less than 2, and
     2) BRUT SATIS KARI / NET SATISLAR is greater than or equal to 2, and
     3) BILANCO KARI / NET SATISLAR is greater than or equal to 2,
Then it is definite (100%) that FAALIYET KAR PUANI,BRUT SATIS KAR
PUANI,BILANCO KAR PUANI NET KAR PUANI FAKTORLERI SDH >= END. STANDARTI is 3.


RULE109 [SDH-END>=-RULES]
-------
If   1) FAALIYET KARI PUANI is greater than or equal to 2, and
     2) BRUT SATIS KARI / NET SATISLAR is less than 2, and
     3) BILANCO KARI / NET SATISLAR is less than 2,
Then it is definite (100%) that FAALIYET KAR PUANI,BRUT SATIS KAR
PUANI,BILANCO KAR PUANI NET KAR PUANI FAKTORLERI SDH >= END. STANDARTI is 3.


RULE110 [SDH-END>=-RULES]
-------
If   STOKLAR YETERLIMI is not true,
Then it is definite (100%) that STOK YENILENMESI,STOKLARIN YETERLILIGI,REKABET
FAKTORLERI SDH >= END. STANDARTI is 1.


RULE111 [SDH-END>=-RULES]
-------
If   1) STOKLARIN YENILENMESI is not true, and
     2) STOKLAR YETERLIMI,
Then it is definite (100%) that STOK YENILENMESI,STOKLARIN YETERLILIGI,REKABET
FAKTORLERI SDH >= END. STANDARTI is 2.
```

RULE112 [SDH-END>=-RULES]

If 1) STOKLARIN YENILENMESI, and
2) STOKLAR YETERLIMI,
Then it is definite (100%) that STOK YENILENMESI,STOKLARIN YETERLILIGI,REKABET FAKTORLERI SDH >= END. STANDARTI is 3.

Rule Group STOK-DEVIR-HIZI-RULES

RULE097 [STOK-DEVIR-HIZI-RULES]

If KREDININ TIPI is KISA-VADELI,
Then it is definite (100%) that STOK DEVIR HIZI PUANI is [[[9 times ENDUSTRI STANDARTINA GORE SOK DEVIR HIZI PUANI ETKILEYEN FAKTORLERDEN SONRA] plus [7 times GECMIS YILA GORE STOK DEVIR HIZI PUANI]] divided by 16].

RULE098 [STOK-DEVIR-HIZI-RULES]

If KREDININ TIPI is ORTA-VADELI,
Then it is definite (100%) that STOK DEVIR HIZI PUANI is [[[6 times ENDUSTRI STANDARTINA GORE SOK DEVIR HIZI PUANI ETKILEYEN FAKTORLERDEN SONRA] plus [10 times GECMIS YILA GORE STOK DEVIR HIZI PUANI]] divided by 16].

RULE099 [STOK-DEVIR-HIZI-RULES]

If [SATILAN MALIN MALIYETI divided by ORTALAMA STOK DONEM BASI + DONEM SONU / 2] is greater than GECMIS YIL STOK DEVIR HIZI,
Then it is definite (100%) that GECMIS YILA GORE STOK DEVIR HIZI PUANI is 3.

RULE100 [STOK-DEVIR-HIZI-RULES]

If [SATILAN MALIN MALIYETI divided by ORTALAMA STOK DONEM BASI + DONEM SONU / 2] is less than GECMIS YIL STOK DEVIR HIZI,
Then it is definite (100%) that GECMIS YILA GORE STOK DEVIR HIZI PUANI is 1.

RULE101 [STOK-DEVIR-HIZI-RULES]

If [SATILAN MALIN MALIYETI divided by ORTALAMA STOK DONEM BASI + DONEM SONU / 2] is greater than STOK DEVIR HIZI ENDUSTRI STANDARTI,
Then it is definite (100%) that STOK DEVIR HIZI PUANI ENDUSTRI STANDARTINA GORE is 3.

RULE102 [STOK-DEVIR-HIZI-RULES]

If [SATILAN MALIN MALIYETI divided by ORTALAMA STOK DONEM BASI + DONEM SONU / 2] is less than STOK DEVIR HIZI ENDUSTRI STANDARTI,
Then it is definite (100%) that STOK DEVIR HIZI PUANI ENDUSTRI STANDARTINA GORE is 1.

RULE103 [STOK-DEVIR-HIZI-RULES]

If [SATILAN MALIN MALIYETI divided by ORTALAMA STOK DONEM BASI + DONEM SONU / 2] is greater than or equal to STOK DEVIR HIZI ENDUSTRI STANDARTI,
Then it is definite (100%) that ENDUSTRI STANDARTINA GORE SOK DEVIR HIZI PUANI ETKILEYEN FAKTORLERDEN SONRA is [[[[10 times STOK DEVIR HIZI PUANI ENDUSTRI STANDARTINA GORE] plus [8 times FAALIYET KAR PUANI,BRUT SATIS KAR PUANI,BILANCO KAR PUANI NET KAR PUANI FAKTORLERI SDH >= END. STANDARTI]] plus [6 times STOK YENILENMESI,STOKLARIN YETERLILIGI,REKABET FAKTORLERI SDH >= END. STANDARTI]] divided by 24].

RULE104 [STOK-DEVIR-HIZI-RULES]

If [SATILAN MALIN MALIYETI divided by ORTALAMA STOK DONEM BASI + DONEM SONU / 2] is less than STOK DEVIR HIZI ENDUSTRI STANDARTI,
Then it is definite (100%) that ENDUSTRI STANDARTINA GORE SOK DEVIR HIZI PUANI ETKILEYEN FAKTORLERDEN SONRA is [[[[10 times STOK DEVIR HIZI PUANI ENDUSTRI STANDARTINA GORE] plus [5 times STOK KALITESI,EMNIYET STOGU,STOKLARA YATIRIM POLITIKASI FAKTORLERI SDH < END. STANDARTI]] plus [3 times REKABET,TUKETICI ZEVKLERINDE DEGISIM FAKTORLERI SDH < END. STANDARTI]] divided by 18].

B. PARAMETER GROUPS

Parameter Group ADH-END<=-PARMS

No parameters defined

Parameter Group ADH-END>-PARMS

No parameters defined

Parameter Group AKTIF-DEVIR-HIZI-PARMS

AKDEV-END [AKTIF-DEVIR-HIZI-PARMS]

TRANSLATION: (AKTIF DEVIR HIZI ENDUSTRI STANDARTI)
PROMPT: #T
TYPE: SINGLEVALUED
EXPECT: POSITIVE-NUMBER
USED-BY: RULE132 RULE133

AKDEV-END-P [AKTIF-DEVIR-HIZI-PARMS]

TRANSLATION: (AKTIF DEVIR HIZI ENDUSTRI STANDARTI PUANI)
CONTAINED-IN: (RULE130 RULE131)
DEFAULT: (VALUE 2)
TYPE: SINGLEVALUED
EXPECT: POSITIVE-NUMBER
RANGE: (1. 3.)
UPDATED-BY: RULE132 RULE133

AKDEV-GEC [AKTIF-DEVIR-HIZI-PARMS]

TRANSLATION: (AKTIF DEVIR HIZI GECMIS YIL ORANI)
PROMPT: #T
TYPE: SINGLEVALUED
EXPECT: POSITIVE-NUMBER
USED-BY: RULE134 RULE135

AKDEV-GEC-P [AKTIF-DEVIR-HIZI-PARMS]

TRANSLATION: (AKTIF DEVIR HIZI GECMIS YIL PUANI)
CONTAINED-IN: (RULE130 RULE131)
DEFAULT: (VALUE 2)
TYPE: SINGLEVALUED

```
EXPECT:  POSITIVE-NUMBER
RANGE:  (1. 3.)
UPDATED-BY:  RULE134 RULE135
```

Parameter Group ALACAK-DEVIR-HIZI-PARMS

```
ADH-END [ALACAK-DEVIR-HIZI-PARMS]
-------
TRANSLATION:  (ALACAK DEVIR HIZI ENDUSTRI STANDARTI)
PROMPT:  #T
TYPE:  SINGLEVALUED
EXPECT:  POSITIVE-NUMBER
USED-BY:  RULE085 RULE086 RULE087 RULE088

ADH-END-P [ALACAK-DEVIR-HIZI-PARMS]
---------
TRANSLATION:  (ENDUSTRI STANDARTLARINA GORE ALACAK DEVIR HIZ PUANI
               (ETKILEYEN FAKTORLERDEN SONRA))
DEFAULT:  (VALUE 2)
CONTAINED-IN:  (RULE081 RULE080)
TYPE:  SINGLEVALUED
EXPECT:  POSITIVE-NUMBER
RANGE:  (1. 3.)
UPDATED-BY:  RULE085 RULE086

ADH-GEC [ALACAK-DEVIR-HIZI-PARMS]
-------
TRANSLATION:  (GECMIS YIL ALACAK DEVIR HIZI)
PROMPT:  #T
TYPE:  SINGLEVALUED
EXPECT:  POSITIVE-NUMBER
USED-BY:  RULE084 RULE083

ADH-GEC-P [ALACAK-DEVIR-HIZI-PARMS]
---------
TRANSLATION:  (GECMIS YILA GORE ALACAK DEVIR HIZ PUANI)
DEFAULT:  (VALUE 2)
CONTAINED-IN:  (RULE081 RULE080)
TYPE:  SINGLEVALUED
EXPECT:  POSITIVE-NUMBER
RANGE:  (1. 3.)
UPDATED-BY:  RULE084 RULE083

ADH-P1 [ALACAK-DEVIR-HIZI-PARMS]
------
```

```
TRANSLATION:  (ENDUSTRI STANDATINA GORE HESAPLANAN PUAN)
DEFAULT:  (VALUE 2)
CONTAINED-IN:  (RULE085 RULE086)
TYPE:  SINGLEVALUED
EXPECT:  POSITIVE-NUMBER
RANGE:  (1. 3.)
UPDATED-BY:  RULE087 RULE088

ADHX1 [ALACAK-DEVIR-HIZI-PARMS]
-----
TRANSLATION:  (ETKIN TAHSILAT,KREDILI SATISLARDA KISITLAYICI FAKTORLERI
                (ALACAK DEVIR HIZI <= ENDUTRI STANDARTI))
CONTAINED-IN:  (RULE085)
TYPE:  SINGLEVALUED
EXPECT:  POSITIVE-NUMBER
RANGE:  (1. 3.)
UPDATED-BY:  RULE089 RULE090

ADHX2 [ALACAK-DEVIR-HIZI-PARMS]
-----
TRANSLATION:  (REKABET,ETKIN TAHSILAT KREDILI SATISLARDA KISITLAYICI
              FAKTORLERI
                (ALACAK DEVIR HIZI > ENDUSTRI STANDARTI))
CONTAINED-IN:  (RULE086)
TYPE:  SINGLEVALUED
EXPECT:  POSITIVE-NUMBER
RANGE:  (1. 3.)
UPDATED-BY:  RULE091 RULE092 RULE093

ATAHSIL-P [ALACAK-DEVIR-HIZI-PARMS]
---------
TRANSLATION:  (ALACAK ORTALAMA TAHSIL SURESI PUANI)
DEFAULT:  (VALUE 2)
CONTAINED-IN:  (RULE081 RULE080)
TYPE:  SINGLEVALUED
EXPECT:  POSITIVE-NUMBER
RANGE:  (1. 3.)
UPDATED-BY:  RULE094 RULE095 RULE096

KREDILI-SATISLAR [ALACAK-DEVIR-HIZI-PARMS]
----------------
TRANSLATION:  (KREDILI SATISLAR TOPLAMI)
PROMPT:  (KREDILI SATISLAR TOPLAMI)
TYPE:  SINGLEVALUED
EXPECT:  POSITIVE-NUMBER
USED-BY:  RULE084 RULE083 RULE085 RULE086 RULE087 RULE088 RULE094 RULE095
          RULE096

KREDILI-SATISLARDA-KISITLAYICI [ALACAK-DEVIR-HIZI-PARMS]
------------------------------
TRANSLATION:  (KREDILI SATISLARDA KISITLAYICI)
```

```
PROMPT:  #T
TYPE:  YES/NO
USED-BY:  RULE089 RULE090 RULE091 RULE092 RULE093

PERSONEL-ALACAGI [ALACAK-DEVIR-HIZI-PARMS]
----------------
TRANSLATION:  (PERSONEL ALACAGI)
PROMPT:  #T
TYPE:  YES/NO
USED-BY:  RULE082

PERSONEL-ALACAK-M [ALACAK-DEVIR-HIZI-PARMS]
-----------------
TRANSLATION:  (PERSONEL ALACAK MIKTARI)
PROMPT:  #T
CONTAINED-IN:  (RULE082)
TYPE:  SINGLEVALUED
EXPECT:  POSITIVE-NUMBER

SABIT-DEGER-SATIS [ALACAK-DEVIR-HIZI-PARMS]
-----------------
TRANSLATION:  (SABIT DEGER SATIS ALACAGI)
PROMPT:  #T
TYPE:  YES/NO
USED-BY:  RULE082

SABIT-DEGER-SATIS-M [ALACAK-DEVIR-HIZI-PARMS]
-------------------
TRANSLATION:  (SABIT DEGER SATIS MIKTARI)
PROMPT:  #T
CONTAINED-IN:  (RULE082)
TYPE:  SINGLEVALUED
EXPECT:  POSITIVE-NUMBER

TICARI-ALACAK [ALACAK-DEVIR-HIZI-PARMS]
-------------
TRANSLATION:  (TICARI ALACAKLAR TOPLAMI)
PROMPT:  (TICARI ALACAKLAR TOPLAMI)
TYPE:  SINGLEVALUED
EXPECT:  POSITIVE-NUMBER
USED-BY:  RULE084 RULE083 RULE085 RULE086 RULE087 RULE088 RULE094 RULE095
          RULE096
UPDATED-BY:  RULE082
```

Parameter Group ALACAK-ORTALAMA-TAH-PARMS

GEC-ATAHSIL [ALACAK-ORTALAMA-TAH-PARMS]

TRANSLATION: (GECEN YIL ORTALAMA TAHSIL SURESI)
PROMPT: #T
TYPE: SINGLEVALUED
EXPECT: POSITIVE-NUMBER
USED-BY: RULE094 RULE095 RULE096

KENDI-VADESI [ALACAK-ORTALAMA-TAH-PARMS]

TRANSLATION: (FIRMANIN ORTALAMA VADESI)
PROMPT: #T
TYPE: SINGLEVALUED
EXPECT: POSITIVE-NUMBER
USED-BY: RULE094 RULE095 RULE096

Parameter Group BILANCO-KAR-NET-PARMS

BILAKAR-END [BILANCO-KAR-NET-PARMS]

TRANSLATION: (BILANCO KARI NET SATISLAR END. STANDARTI)
PROMPT: #T
TYPE: SINGLEVALUED
EXPECT: POSITIVE-NUMBER
USED-BY: RULE183 RULE184

BILAKAR-END-P [BILANCO-KAR-NET-PARMS]

TRANSLATION: (BILANCO KARI NET SATISLAR ORANI PUANI END. STANDARTINA GORE)
CONTAINED-IN: (RULE181 RULE182)
DEFAULT: (VALUE 2)
TYPE: SINGLEVALUED
EXPECT: POSITIVE-NUMBER
RANGE: (1. 3.)
UPDATED-BY: RULE183 RULE184

BILAKAR-GEC [BILANCO-KAR-NET-PARMS]

TRANSLATION: (BILANCO KARI NET SATISLAR GECMIS YIL ORANI)
PROMPT: #T

```
TYPE:  SINGLEVALUED
EXPECT:  POSITIVE-NUMBER
USED-BY:  RULE186 RULE185

BILAKAR-GEC-P [BILANCO-KAR-NET-PARMS]
-------------
TRANSLATION:  (BILANCO KARI NET SATISLAR PUANI GECMIS YILA GORE)
CONTAINED-IN:  (RULE181 RULE182)
DEFAULT:  (VALUE 2)
TYPE:  SINGLEVALUED
EXPECT:  POSITIVE-NUMBER
RANGE:  (1. 3.)
UPDATED-BY:  RULE186 RULE185

BILANCO-KARI [BILANCO-KAR-NET-PARMS]
------------
TRANSLATION:  (BILANCO KARI)
PROMPT:  #T
TYPE:  SINGLEVALUED
EXPECT:  POSITIVE-NUMBER
USED-BY:  RULE183 RULE184 RULE186 RULE185
```

Parameter Group BORCLAR-AKTIFLER-PARMS

```
BORCAK-END-P [BORCLAR-AKTIFLER-PARMS]
------------
TRANSLATION:  (BORCLAR AKTIF PUANI
                (END. STANDARTINA GORE))
CONTAINED-IN:  (RULE165 RULE166)
DEFAULT:  (VALUE 2)
TYPE:  SINGLEVALUED
EXPECT:  POSITIVE-NUMBER
RANGE:  (1. 3.)
UPDATED-BY:  RULE169 RULE170

BORCAK-GEC [BORCLAR-AKTIFLER-PARMS]
----------
TRANSLATION:  (BORCLAR AKTIF GECMIS YIL ORANI)
PROMPT:  #T
TYPE:  SINGLEVALUED
EXPECT:  POSITIVE-NUMBER
USED-BY:  RULE167 RULE168

BORCAK-GEC-P [BORCLAR-AKTIFLER-PARMS]
------------
```

```
TRANSLATION:  (BORCLAR AKTIF PUANI
               (GECMIS YILA GORE))
CONTAINED-IN:  (RULE165 RULE166)
DEFAULT:  (VALUE 2)
TYPE:  SINGLEVALUED
EXPECT:  POSITIVE-NUMBER
RANGE:  (1. 3.)
UPDATED-BY:  RULE167 RULE168

LIKIDITE-ETKI [BORCLAR-AKTIFLER-PARMS]
--------------
TRANSLATION:  (BORCLAR AKTIF PUANINA DONER DEGERLERIN LIKIDITE ETKISI)
CONTAINED-IN:  (RULE165 RULE166)
TYPE:  SINGLEVALUED
EXPECT:  POSITIVE-NUMBER
RANGE:  (1. 3.)
UPDATED-BY:  RULE172 RULE173 RULE171
```

Parameter Group BORCLAR-MADDIOZSER-PARMS

```
BOR-END-P [BORCLAR-MADDIOZSER-PARMS]
---------
TRANSLATION:  (BORCLAR MADDI OZSERMAYE PUANI END. STANDARTI
               (ETKILEYEN FAKTORLERDEN SONRA))
CONTAINED-IN:  (RULE137 RULE136)
TYPE:  SINGLEVALUED
EXPECT:  POSITIVE-NUMBER
RANGE:  (1. 3.)
UPDATED-BY:  RULE142 RULE143

BOR-GEC [BORCLAR-MADDIOZSER-PARMS]
-------
TRANSLATION:  (GECMIS YIL BORCLAR MADDI OZSERMAYE ORANI)
PROMPT:  #T
TYPE:  SINGLEVALUED
EXPECT:  POSITIVE-NUMBER
USED-BY:  RULE138 RULE139

BOR-GEC-P [BORCLAR-MADDIOZSER-PARMS]
---------
TRANSLATION:  (BORCLAR MADDI OZSERMAYE PUANI GECMIS YILA GORE)
CONTAINED-IN:  (RULE137 RULE136)
DEFAULT:  (VALUE 2)
TYPE:  SINGLEVALUED
EXPECT:  POSITIVE-NUMBER
```

```
RANGE:  (1. 3.)
UPDATED-BY:  RULE138 RULE139

BOR1 [BORCLAR-MADDIOZSER-PARMS]
----
TRANSLATION:  (BORCLAR MADDI OZSERMAYE PUANI END. STANDARTINA GORE)
CONTAINED-IN:  (RULE142 RULE143)
DEFAULT:  (VALUE 2)
TYPE:  SINGLEVALUED
EXPECT:  POSITIVE-NUMBER
RANGE:  (1. 3.)
UPDATED-BY:  RULE140 RULE141

BORX1 [BORCLAR-MADDIOZSER-PARMS]
-----
TRANSLATION:  (ISTIKRAR REKABET FAKTORLERI)
CONTAINED-IN:  (RULE142 RULE143)
TYPE:  SINGLEVALUED
EXPECT:  POSITIVE-NUMBER
RANGE:  (1. 3.)
UPDATED-BY:  RULE144 RULE146 RULE145

BORX2 [BORCLAR-MADDIOZSER-PARMS]
-----
TRANSLATION:  (DONER DEGERLERIN LIKIDITE ORANI,ALACAK DEVIR HIZI FAKTORLERI)
CONTAINED-IN:  (RULE142 RULE143)
TYPE:  SINGLEVALUED
EXPECT:  POSITIVE-NUMBER
RANGE:  (1. 3.)
UPDATED-BY:  RULE148 RULE147 RULE149

BORX3 [BORCLAR-MADDIOZSER-PARMS]
-----
TRANSLATION:  (VERILEN MAL HIZMET FIYATINDA OLABILECEK DUSMELER FAKTORU)
DEFAULT:  (VALUE 2)
CONTAINED-IN:  (RULE142 RULE143)
TYPE:  SINGLEVALUED
EXPECT:  POSITIVE-NUMBER
RANGE:  (1. 3.)
UPDATED-BY:  RULE151 RULE150
```

Parameter Group BORMADDI-END-PARMS

```
URET-MAL-HIZMET [BORMADDI-END-PARMS]
---------------
```

```
TRANSLATION:  (URETILE MAL VEYA HIZMETLERIN FIYATLARINDA DUSME OLASILIGI)
PROMPT:  #T
CERTAINTY-FACTOR-RANGE:  POSITIVE
TYPE:  SINGLEVALUED
EXPECT:  (DUSME)
USED-BY:  RULE151 RULE150
```

Parameter Group BRSATISKARI-NETSATIS-PARMS

```
BRKAR-END [BRSATISKARI-NETSATIS-PARMS]
---------
TRANSLATION:  (BRUT SATIS KARI NET SATISLAR END. STANDARTI)
PROMPT:  #T
TYPE:  SINGLEVALUED
EXPECT:  POSITIVE-NUMBER
USED-BY:  RULE196 RULE195

BRKAR-END-P [BRSATISKARI-NETSATIS-PARMS]
-----------
TRANSLATION:  (BRUT SATIS KARI NET SATISLAR ORANI PUANI END. STANDARTINA GORE)
DEFAULT:  (VALUE 2)
CONTAINED-IN:  (RULE194 RULE193)
TYPE:  SINGLEVALUED
EXPECT:  POSITIVE-NUMBER
RANGE:  (1. 3.)
UPDATED-BY:  RULE196 RULE195

BRKAR-GEC [BRSATISKARI-NETSATIS-PARMS]
---------
TRANSLATION:  (BRUT SATIS KARI NET SATISLAR GECMIS YIL ORANI)
PROMPT:  #T
TYPE:  SINGLEVALUED
EXPECT:  POSITIVE-NUMBER
USED-BY:  RULE198 RULE197

BRKAR-GEC-P [BRSATISKARI-NETSATIS-PARMS]
-----------
TRANSLATION:  (BRUT SATIS KARI NET SATISLAR ORANI PUANI GECMIS YILA GORE)
DEFAULT:  (VALUE 2)
CONTAINED-IN:  (RULE194 RULE193)
TYPE:  SINGLEVALUED
EXPECT:  POSITIVE-NUMBER
RANGE:  (1. 3.)
UPDATED-BY:  RULE198 RULE197
```

```
BRUT-SATIS [BRSATISKARI-NETSATIS-PARMS]
----------
TRANSLATION:  (BRUT SATISLAR KARI)
PROMPT:  #T
TYPE:  SINGLEVALUED
EXPECT:  POSITIVE-NUMBER
USED-BY:  RULE198 RULE197 RULE196 RULE195
```

Parameter Group CARI-ORAN-END<=-PARMS

No parameters defined

Parameter Group CARI-ORAN-END>-PARMS

No parameters defined

Parameter Group CARI-ORAN-GECMIS<=-PARMS

```
NAKDEN-KAR [CARI-ORAN-GECMIS<=-PARMS]
----------
TRANSLATION:  (NAKDEN KAR DAGITIMI VARMI)
PROMPT:  (NAKDEN KAR DAGITIMI VARMI)
TYPE:  YES/NO
USED-BY:  RULE014 RULE011 RULE013

SABIT-DEGER-ALINDI [CARI-ORAN-GECMIS<=-PARMS]
------------------
TRANSLATION:  (SABIT DEGER SATIN ALINMISMI)
PROMPT:  (SABIT DEGER SATIN ALINMISMI)
TYPE:  YES/NO
USED-BY:  RULE014 RULE011 RULE013

SERMAYE-AZALTILMASI [CARI-ORAN-GECMIS<=-PARMS]
-------------------
TRANSLATION:  (SERMAYE AZALTILMISMI)
PROMPT:  (SERMAYE AZALTILMISMI)
TYPE:  YES/NO
USED-BY:  RULE012 RULE011 RULE013
```

UZUN-BORC-ODENDI [CARI-ORAN-GECMIS<=-PARMS]

TRANSLATION: (UZUN VADELI BIR BORC ODENMISMI)
PROMPT: (UZUN VADELI BIR BORC ODENMISMI)
TYPE: YES/NO
USED-BY: RULE014 RULE011 RULE013

Parameter Group CARI-ORAN-GECMIS>-PARMS

BAGLI-SABIT-SATISI [CARI-ORAN-GECMIS>-PARMS]

TRANSLATION: (BAGLI SABIT SATISI YAPILDIMI)
PROMPT: (BAGLI SABIT SATISI YAPILDIMI)
TYPE: YES/NO
USED-BY: RULE015 RULE016 RULE017 RULE018

KISA-BORC-ODENDI [CARI-ORAN-GECMIS>-PARMS]

TRANSLATION: (KISA VADELI BIR BORC ODENDIMI)
PROMPT: (KISA VADELI BIR BORC ODENDIMI)
TYPE: YES/NO
USED-BY: RULE015 RULE016

SERMAYE-ARTISI [CARI-ORAN-GECMIS>-PARMS]

TRANSLATION: (SERMAYE ARTISI YAPILDIMI)
PROMPT: (SERMAYE ARTISI YAPILDIMI)
TYPE: YES/NO

UZUN-BORC-ALINDI [CARI-ORAN-GECMIS>-PARMS]

TRANSLATION: (UZUN VADELI BIR BORC ALINDIMI)
PROMPT: (UZUN VADELI BIR BORC ALINDIMI)
TYPE: YES/NO
USED-BY: RULE015 RULE016 RULE017 RULE018

Parameter Group CARI-ORAN-PARMS

ALACAK-TAHSIL-EDEBILME [CARI-ORAN-PARMS]

```
TRANSLATION:  (ALACAKLARIN TAHSIL EDILEBILME OLASILIGI)
PROMPT:  (ALACAKLARIN TAHSIL EDILEBILME OLASILIGI)
EXPECT:  (EDEBILIR)
CERTAINTY-FACTOR-RANGE:  POSITIVE
TYPE:  SINGLEVALUED
USED-BY:  RULE034 RULE035 RULE036 RULE037 RULE039 RULE033

ALISLAR [CARI-ORAN-PARMS]
-------
TRANSLATION:  (ALISLARIN TIPI
                (VADELI/VADESIZ))
PROMPT:  (ALISLARIN TIPI
           (VADELI/VADESIZ))
TYPE:  SINGLEVALUED
EXPECT:  (VADELI VADESIZ)
USED-BY:  RULE042 RULE043 RULE044 RULE049 RULE060 RULE061 RULE048 RULE045
          RULE047 RULE046

BILANCO-MEVSIM [CARI-ORAN-PARMS]
--------------
TRANSLATION:  (BILANCO MEVSIMLIK HAREKETLERIN OLDUGU DONEMDEMI HAZIRLANDI)
PROMPT:  (BILANCO MEVSIMLIK HAREKETLERIN OLDUGU DONEMDEMI HAZIRLANDI)
TYPE:  YES/NO
USED-BY:  RULE068 RULE069 RULE071 RULE070

CARI-END [CARI-ORAN-PARMS]
--------
TRANSLATION:  (CARI ORANIN ENDUSTRI STANDARTI)
PROMPT:  (CARI ORANIN ENDUSTRI STANDARTI)
TYPE:  SINGLEVALUED
EXPECT:  POSITIVE-NUMBER
USED-BY:  RULE023 RULE024 RULE025 RULE022

CARI-END-GENEL [CARI-ORAN-PARMS]
--------------
TRANSLATION:  (CARI ENDUTRI PUANI
                (ETKILEYEN FAKTORLERDEN SONRA))
CONTAINED-IN:  (RULE019 RULE020)
TYPE:  SINGLEVALUED
EXPECT:  POSITIVE-NUMBER
RANGE:  (1. 3.)
UPDATED-BY:  RULE023 RULE022

CARI-END-P [CARI-ORAN-PARMS]
----------
TRANSLATION:  (CARI ORANININ ENDUSTRI STANDARTI ILE KARSILASTIRMA PUANI)
DEFAULT:  (VALUE 2)
CONTAINED-IN:  (RULE023 RULE022)
TYPE:  SINGLEVALUED
EXPECT:  POSITIVE-NUMBER
RANGE:  (1. 3.)
```

```
UPDATED-BY:  RULE024 RULE025

CARI-GECMIS [CARI-ORAN-PARMS]
-----------
TRANSLATION:  (GECMIS YIL CARI ORANI)
PROMPT:  (GECMIS YIL CARI ORANI)
TYPE:  SINGLEVALUED
EXPECT:  POSITIVE-NUMBER
USED-BY:  RULE028 RULE029 RULE031 RULE032

CARI-GECMIS-GENEL [CARI-ORAN-PARMS]
-----------------
TRANSLATION:  (CARI ORAN GECMIS YIL PUANI
                (ETKILEYEN FAKTORLERDEN SONRA))
CONTAINED-IN:  (RULE019 RULE020)
TYPE:  SINGLEVALUED
EXPECT:  POSITIVE-NUMBER
RANGE:  (1. 3.)
UPDATED-BY:  RULE028 RULE029

CARI-GECMIS-P [CARI-ORAN-PARMS]
-------------
TRANSLATION:  (CARI ORANIN GECMIS YILKI ILE KARSILASTIRMA PUANI)
DEFAULT:  (VALUE 2)
CONTAINED-IN:  (RULE028 RULE029)
TYPE:  SINGLEVALUED
EXPECT:  POSITIVE-NUMBER
RANGE:  (1. 3.)
UPDATED-BY:  RULE031 RULE032

CARIX1 [CARI-ORAN-PARMS]
------
TRANSLATION:  (SATIS TIPI,ALACAK DEVIR HIZI,TICARI ALACAKLARININ SENETLI
              SENETSIZ DAGILIMI,ALACAK TAHSIL EDILEBILME OLASILIK FAKTORLERI
              HESAPLANAN ORAN <= ENDUSTRI STANDARTI)
CONTAINED-IN:  (RULE023)
TYPE:  SINGLEVALUED
EXPECT:  POSITIVE-NUMBER
RANGE:  (1. 3.)
UPDATED-BY:  RULE034 RULE035 RULE036 RULE037 RULE038 RULE039 RULE033

CARIX10 [CARI-ORAN-PARMS]
-------
TRANSLATION:  (MEVSIMLIK HAREKET,BILANCONUN O MEVSIMDE DUZENLENME FAKTORLERI
              HESAPLANAN ORAN > ENDUSTRI STANDARTI)
CONTAINED-IN:  (RULE022)
RANGE:  (1. 3.)
TYPE:  SINGLEVALUED
EXPECT:  POSITIVE-NUMBER
UPDATED-BY:  RULE068 RULE069
```

```
CARIX11 [CARI-ORAN-PARMS]
-------
TRANSLATION:  (BAGLI SABIT SATISI,UZUN SURELI BORC ALINMASI,SERMAYE
              ARTISI,KISA SURELI BORC ODENMESI FAKTORLERI HESAPLANAN ORAN >
              GECMIS YIL)
CONTAINED-IN:  (RULE029)
TYPE:  SINGLEVALUED
EXPECT:  POSITIVE-NUMBER
RANGE:  (1. 3.)
UPDATED-BY:  RULE015 RULE016 RULE017 RULE018

CARIX12 [CARI-ORAN-PARMS]
-------
TRANSLATION:  (NAKDEN KAR DAGITIMI,UZUN SURELI BORC ODENMESI,SABIT DEGER SATIN
              ALINMASI, SERMAYE AZALTILMASI FAKTORLERI HESAPLANAN ORAN <=
              GECMIS YIL)
CONTAINED-IN:  (RULE028)
TYPE:  SINGLEVALUED
EXPECT:  POSITIVE-NUMBER
RANGE:  (1. 3.)
UPDATED-BY:  RULE014 RULE011 RULE013

CARIX2 [CARI-ORAN-PARMS]
------
TRANSLATION:  (ALISLARIN TIPI,KISA VADELI BORCLARIN AYLARA GORE
              DAGILIMI,TICARI BANKALARDAN KREDI KULLANMA LIMITI-BORCLARI
              ROFINANS ETME-BORCLARI KONSOLIDE ETME,YAKIN TARIHTE BUYUK BIR
              ODEME VARMI FAKTORLERI HESAPLANAN ORAN <= ENDUSTRI STANDARTI)
CONTAINED-IN:  (RULE023)
TYPE:  SINGLEVALUED
EXPECT:  POSITIVE-NUMBER
RANGE:  (1. 3.)
UPDATED-BY:  RULE042 RULE043 RULE044 RULE049 RULE048 RULE045 RULE047 RULE046

CARIX3 [CARI-ORAN-PARMS]
------
TRANSLATION:  (STOK DEVIR HIZI,SATIS ISTIKRARI,PIYASA REKABETI FAKTORLERI
              HESAPLANAN ORAN <= ENDUSTRI STANDARTI)
CONTAINED-IN:  (RULE023)
TYPE:  SINGLEVALUED
EXPECT:  POSITIVE-NUMBER
RANGE:  (1. 3.)
UPDATED-BY:  RULE050 RULE051 RULE052

CARIX4 [CARI-ORAN-PARMS]
------
TRANSLATION:  (DONER DEGERLERIN LIKIDITESI YUKSEK OLANLARININ TOPLAMA
              ORANI,DONER DEGERLERDE KIYMET DEGISIKLIGI OLASILIK FAKTORLERI
              HESAPLANAN ORAN <= ENDUSTRI STANDARTI)
CONTAINED-IN:  (RULE023)
TYPE:  SINGLEVALUED
```

```
EXPECT:  POSITIVE-NUMBER
RANGE:  (1. 3.)
UPDATED-BY:  RULE062 RULE063 RULE064

CARIX5 [CARI-ORAN-PARMS]
------
TRANSLATION:  (MEVSIMLIK HAREKET,BILANCONUN O MEVSIMDE DUZENLENME FAKTORLERI
              HESAPLANAN ORAN <= ENDUSTRI STANDARTI)
CONTAINED-IN:  (RULE023)
TYPE:  SINGLEVALUED
EXPECT:  POSITIVE-NUMBER
RANGE:  (1. 3.)
UPDATED-BY:  RULE071 RULE070

CARIX6 [CARI-ORAN-PARMS]
------
TRANSLATION:  (SATIS TIPI,ALACAK DEVIR HIZI,TICARI ALACAKLARININ SENETLI
              SENETSIZ DAGILIMI FAKTORLERI HESAPLANAN ORAN > ENDUSTRI
              STANDARTI)
CONTAINED-IN:  (RULE022)
TYPE:  SINGLEVALUED
EXPECT:  POSITIVE-NUMBER
RANGE:  (1. 3.)
UPDATED-BY:  RULE056 RULE057 RULE058

CARIX7 [CARI-ORAN-PARMS]
------
TRANSLATION:  (ALISLARIN TIPI,KISA VADELI BORCLARIN AYLARA GORE DAGILIMI,YAKIN
              TARIHTE BUYUK BIR ODEME VARMI FAKTORLERI HESAPLANAN ORAN >
              ENDUSTRI STANDARTI)
CONTAINED-IN:  (RULE022)
TYPE:  SINGLEVALUED
EXPECT:  POSITIVE-NUMBER
RANGE:  (1. 3.)
UPDATED-BY:  RULE059 RULE060 RULE061

CARIX8 [CARI-ORAN-PARMS]
------
TRANSLATION:  (STOK DEVIR HIZI,SATIS ISTIKRARI,PIYASA REKABETI FAKTORLERI
              HESAPLANAN ORAN > ENDUSTRI STANDARTI)
CONTAINED-IN:  (RULE022)
TYPE:  SINGLEVALUED
EXPECT:  POSITIVE-NUMBER
RANGE:  (1. 3.)
UPDATED-BY:  RULE054 RULE055 RULE053

CARIX9 [CARI-ORAN-PARMS]
------
TRANSLATION:  (DONER DEGERLERIN LIKIDITESI YUKSEK OLANLARININ TOPLAMA
              ORANI,DONER DEGERLERDE KIYMET DEGISIKLIGI OLASILIK FAKTORLERI
              HESAPLANAN ORAN > ENDUSTRI STANDARTI)
```

```
CONTAINED-IN:  (RULE022)
TYPE:  SINGLEVALUED
EXPECT:  POSITIVE-NUMBER
RANGE:  (1. 3.)
UPDATED-BY:  RULE065 RULE066 RULE067

DONER-DEGER [CARI-ORAN-PARMS]
-----------
TRANSLATION:  (DONER DEGERLER)
PROMPT:  (DONER DEGERLER)
TYPE:  SINGLEVALUED
EXPECT:  POSITIVE-NUMBER
USED-BY:  RULE023 RULE024 RULE025 RULE028 RULE029 RULE031 RULE032 RULE022
UPDATED-BY:  RULE021

DONER-DEGER-KIY-DEG [CARI-ORAN-PARMS]
-------------------
TRANSLATION:  (DONER DEGERLERDE KIYMET DEGISIM OLASILIGI)
PROMPT:  (DONER DEGERLERDE KIYMET DEGISIMI)
EXPECT:  (VAR)
CERTAINTY-FACTOR-RANGE:  POSITIVE
TYPE:  SINGLEVALUED
USED-BY:  RULE062 RULE063 RULE066 RULE067

KISA-VAD-BORC-AY [CARI-ORAN-PARMS]
----------------
TRANSLATION:  (KISA VADELI BORCLARIN AYLARA GORE DAGILIMI)
PROMPT:  (KIS VADELI BORCLARIN AYLARA GORE DAGILIMI
           (IYI/KOTU))
TYPE:  SINGLEVALUED
EXPECT:  (IYI KOTU)
USED-BY:  RULE042 RULE043 RULE044 RULE049 RULE059 RULE060 RULE061 RULE048
          RULE045 RULE047 RULE046

KONSOLIDE [CARI-ORAN-PARMS]
---------
TRANSLATION:  (BORCLARI KONSOLIDE ETME SANSI VARMI)
PROMPT:  (BORCLARI KONSOLIDE ETME SANSI VARMI)
TYPE:  YES/NO
USED-BY:  RULE043 RULE044 RULE049 RULE048 RULE045 RULE047 RULE046

MEN-DUSUS [CARI-ORAN-PARMS]
---------
TRANSLATION:  (MENKUL DEGER DUSUS MIKTARI)
PROMPT:  (MENKUL DEGER DUSUS MIKTARI)
CONTAINED-IN:  (RULE021)
DEFAULT:  (VALUE 0)
TYPE:  SINGLEVALUED
EXPECT:  POSITIVE-NUMBER
```

```
MENKUL-DEGER-DUSUS [CARI-ORAN-PARMS]
------------------
TRANSLATION:  (MENKUL DEGER DUSUS PASIFTE VARMI)
PROMPT:  (MENKUL DEGER DUSUS PASIFTE VARMI)
TYPE:  YES/NO
USED-BY:  RULE021

MEVSIMLIK [CARI-ORAN-PARMS]
---------
TRANSLATION:  (SATISLAR MEVSIMLIK HAREKETLER GOSTERIYORMU)
PROMPT:  (SATISLAR MEVSIMLIK HAREKETLER GOSTERIYORMU)
TYPE:  YES/NO
USED-BY:  RULE068 RULE069 RULE071 RULE070

ROFINANS [CARI-ORAN-PARMS]
--------
TRANSLATION:  (BORCLARI ROFINANS EDEBILIRMI)
PROMPT:  (BORCLARI ROFINANS EDEBILIRMI)
TYPE:  YES/NO
USED-BY:  RULE043 RULE044 RULE049 RULE048 RULE045 RULE047 RULE046

SATISLAR [CARI-ORAN-PARMS]
--------
TRANSLATION:  (SATISLARIN TIPI
                (VADELI/VADESIZ))
PROMPT:  (SATISLARIN TIPI
           (VADELI/VADESIZ))
TYPE:  SINGLEVALUED
EXPECT:  (VADELI VADESIZ)
USED-BY:  RULE034 RULE036 RULE037 RULE038 RULE033 RULE056 RULE057 RULE058

STOK-DEGER-DUSUS [CARI-ORAN-PARMS]
----------------
TRANSLATION:  (STOK DEGER DUSUS PASIFTE VARMI)
PROMPT:  (STOK DEGER DUSUS PASIFTE VARMI)
TYPE:  YES/NO
USED-BY:  RULE021

STOK-DUSUS-M [CARI-ORAN-PARMS]
------------
TRANSLATION:  (STOK DEGER DUSUS MIKTARI)
PROMPT:  (STOK DEGER DUSUS MIKTARI)
CONTAINED-IN:  (RULE021)
DEFAULT:  (VALUE 0)
TYPE:  SINGLEVALUED
EXPECT:  POSITIVE-NUMBER

TIC-BANK-LIM [CARI-ORAN-PARMS]
------------
TRANSLATION:  (TICARI BANKALARDA HER AN KULLANILABILIR LIMITI VARMI)
PROMPT:  (TICARI BANKALARDA HER AN KULLANILABILIR LIMITI VARMI)
```

```
TYPE:  YES/NO
USED-BY:  RULE043 RULE044 RULE049 RULE048 RULE045 RULE047 RULE046

TICARI-ALACAK-SENETLI [CARI-ORAN-PARMS]
---------------------
TRANSLATION:  (TICARI ALACAKLARIN SENETLI SENETSIZ DAGILIMI)
PROMPT:  (TICARI ALACAKLARIN SENETLI SENETSIZ DAGILIMI)
CERTAINTY-FACTOR-RANGE:  POSITIVE
EXPECT:  (SENETLI)
TYPE:  SINGLEVALUED
USED-BY:  RULE035 RULE036 RULE037 RULE038 RULE039 RULE033 RULE057 RULE058

YAKIN-TARIH-ODEME [CARI-ORAN-PARMS]
-----------------
TRANSLATION:  (YAKIN BIR TARIHTE BUYUK BIR ODEMESI VARMI)
PROMPT:  (YAKIN BIR TARIHTE BUYUK BIR ODEMESI VARMI)
TYPE:  YES/NO
USED-BY:  RULE042 RULE043 RULE044 RULE049 RULE059 RULE060 RULE061 RULE048
          RULE045 RULE047
```

Parameter Group FAALIYET-KARI-END-PARMS

```
SATILAN-MAL-BILESIMI [FAALIYET-KARI-END-PARMS]
--------------------
TRANSLATION:  (SATILAN MAL BILESIMINDE DEGISIM VAR)
PROMPT:  #T
TYPE:  YES/NO
USED-BY:  RULE217 RULE218

SATILAN-MAL-MALIYETI [FAALIYET-KARI-END-PARMS]
--------------------
TRANSLATION:  (SATILAN MAL MALIYETINDE AZALMA VAR)
PROMPT:  #T
TYPE:  YES/NO
USED-BY:  RULE215 RULE216

SATIS-FIYATI-ARTISI [FAALIYET-KARI-END-PARMS]
-------------------
TRANSLATION:  (SATIS FIYATINDA ARTIS VAR)
PROMPT:  #T
TYPE:  YES/NO
USED-BY:  RULE215 RULE216 RULE217 RULE218
```

Parameter Group FAALIYET-KARI-PARMS

```
DEGISIM [FAALIYET-KARI-PARMS]
-------
TRANSLATION:  (SATIS FIYATINDAKI ARTIS,SATILAN MAL MALIYETINDEKI
               AZALIS,SATILAN MAL BILESIMDEKI DEGISIM FAKTORLERI)
CONTAINED-IN:  (RULE205 RULE206)
TYPE:  SINGLEVALUED
EXPECT:  POSITIVE-NUMBER
RANGE:  (1. 3.)
UPDATED-BY:  RULE215 RULE216 RULE217 RULE218

FAAL-END [FAALIYET-KARI-PARMS]
--------
TRANSLATION:  (FAALIYET KARI END. STANDARTI)
PROMPT:  #T
TYPE:  SINGLEVALUED
EXPECT:  POSITIVE-NUMBER
USED-BY:  RULE209 RULE210 RULE207 RULE208

FAAL-END-P [FAALIYET-KARI-PARMS]
----------
TRANSLATION:  (FAALIYET KAR PUANI END. STANDARTINA GORE
                (ETKILEYEN FAKTORLERDEN SONRA))
CONTAINED-IN:  (RULE205 RULE206)
TYPE:  SINGLEVALUED
EXPECT:  POSITIVE-NUMBER
RANGE:  (1. 3.)
UPDATED-BY:  RULE207 RULE208

FAAL-GEC [FAALIYET-KARI-PARMS]
--------
TRANSLATION:  (GECMIS YIL FAALIYET KARI ORANI)
PROMPT:  #T
TYPE:  SINGLEVALUED
EXPECT:  POSITIVE-NUMBER
USED-BY:  RULE211 RULE212

FAAL-GEC-P [FAALIYET-KARI-PARMS]
----------
TRANSLATION:  (FAALIYET KAR PUANI GECMIS YILA GORE)
CONTAINED-IN:  (RULE205 RULE206)
DEFAULT:  (VALUE 2)
TYPE:  SINGLEVALUED
EXPECT:  POSITIVE-NUMBER
RANGE:  (1. 3.)
UPDATED-BY:  RULE211 RULE212
```

```
FAAL-KAR [FAALIYET-KARI-PARMS]
--------
TRANSLATION:  (FAALIYET KARI)
PROMPT:  #T
TYPE:  SINGLEVALUED
EXPECT:  POSITIVE-NUMBER
USED-BY:  RULE209 RULE210 RULE211 RULE212 RULE207 RULE208

FEP1 [FAALIYET-KARI-PARMS]
----
TRANSLATION:  (FAALIYE KAR PUANI END. STANDARTINA GORE)
CONTAINED-IN:  (RULE207 RULE208)
DEFAULT:  (VALUE 2)
TYPE:  SINGLEVALUED
EXPECT:  POSITIVE-NUMBER
RANGE:  (1. 3.)
UPDATED-BY:  RULE209 RULE210

FEPX1 [FAALIYET-KARI-PARMS]
-----
TRANSLATION:  (OZ SERMAYE DEVIR HIZ FAKTORU)
CONTAINED-IN:  (RULE207 RULE208)
DEFAULT:  (VALUE 2)
TYPE:  SINGLEVALUED
EXPECT:  POSITIVE-NUMBER
RANGE:  (1. 3.)
UPDATED-BY:  RULE213 RULE214
```

Parameter Group FRAMETYPES

```
ADH-END<= [FRAMETYPES]
---------
TRANSLATION:  (ALACAK DEVIR HIZINI ETKILEYEN FAKTORLER
                (ALACAK DEVIR HIZI <= ENDUSTRI STANDARTI))
IDENTIFIER:  "ADH-END<=-"
RULEGROUPS:  (ADH-END<=-RULES)
PARMGROUP:  ADH-END<=-PARMS
PARENTS:  (ALACAK-DEVIR-HIZI KREDI-ANALIZ-ROOT)
PROMPTEVER:  (ALACAK DEVIR HIZINI ETKILEYEN FAKTORLER
               (ADH <= END. STANDARTI))

ADH-END> [FRAMETYPES]
--------
TRANSLATION:  (ALACAK DEVIR HIZINI ETKILEYEN FAKTORLER
                (ADH > END. STANDARTI))
```

```
IDENTIFIER:  "ADH-END>-"
RULEGROUPS:  (ADH-END>-RULES)
PARMGROUP:  ADH-END>-PARMS
PARENTS:  (ALACAK-DEVIR-HIZI KREDI-ANALIZ-ROOT)
PROMPTEVER:  (ALACAK DEVIR HIZINI ETKILEYEN FAKTORLER
               (ADH > END. STANDARTI))

AKTIF-DEVIR-HIZI [FRAMETYPES]
-----------------
TRANSLATION:  (AKTIF DEVIR HIZI PUANI)
IDENTIFIER:  "AKTIF-DEVIR-HIZI-"
RULEGROUPS:  (AKTIF-DEVIR-HIZI-RULES)
PARMGROUP:  AKTIF-DEVIR-HIZI-PARMS
PARENTS:  (KREDI-ANALIZ-ROOT)
PROMPTEVER:  (AKTIF DEVIR HIZI PUANININ HESAPLANMASI)
INITIALDATA:  (AKDEV-END AKDEV-GEC)

ALACAK-DEVIR-HIZI [FRAMETYPES]
------------------
TRANSLATION:  (ALACAK DEVIR HIZI)
OFFSPRING:  (ADH-END<= ADH-END> ALACAK-ORTALAMA-TAH)
IDENTIFIER:  "ALACAK-DEVIR-HIZI-"
RULEGROUPS:  (ALACAK-DEVIR-HIZI-RULES)
PARMGROUP:  ALACAK-DEVIR-HIZI-PARMS
PARENTS:  (KREDI-ANALIZ-ROOT)
PROMPTEVER:  (ALACAK DEVIR HIZI)
INITIALDATA:  (KREDILI-SATISLAR TICARI-ALACAK)

ALACAK-ORTALAMA-TAH [FRAMETYPES]
--------------------
TRANSLATION:  (ALACAK ORTALAMA TAHSIL PUANI)
IDENTIFIER:  "ALACAK-ORTALAMA-TAH-"
RULEGROUPS:  (ALACAK-ORTALAMA-TAH-RULES)
PARMGROUP:  ALACAK-ORTALAMA-TAH-PARMS
PARENTS:  (ALACAK-DEVIR-HIZI KREDI-ANALIZ-ROOT)
PROMPTEVER:  (ALACAK ORTALAMA TAHSIL PUANI)
INITIALDATA:  (GEC-ATAHSIL KENDI-VADESI)

BILANCO-KAR-NET [FRAMETYPES]
---------------
TRANSLATION:  (BILANCO KARI NET SATISLAR ORANI)
IDENTIFIER:  "BILANCO-KAR-NET-"
RULEGROUPS:  (BILANCO-KAR-NET-RULES)
PARMGROUP:  BILANCO-KAR-NET-PARMS
PARENTS:  (KREDI-ANALIZ-ROOT)
PROMPTEVER:  (BILANCO KARI NET SATISLAR ORAN PUANI)
INITIALDATA:  (BILANCO-KARI)

BORCLAR-AKTIFLER [FRAMETYPES]
----------------
TRANSLATION:  (BORCLAR AKTIFLER ORANI)
```

```
IDENTIFIER:  "BORCLAR-AKTIFLER-"
RULEGROUPS:  (BORCLAR-AKTIFLER-RULES)
PARMGROUP:  BORCLAR-AKTIFLER-PARMS
PARENTS:  (KREDI-ANALIZ-ROOT)
PROMPTEVER:  (BORCLAR AKTIFLER ORAN PUANI)
INITIALDATA:  (BORCAK-GEC)

BORCLAR-MADDIOZSER [FRAMETYPES]
-------------------
TRANSLATION:  (BORCLAR / MADDI OZSERMAYE ORAN PUANI)
OFFSPRING:  (BORMADDI-END)
IDENTIFIER:  "BORCLAR-MADDIOZSER-"
RULEGROUPS:  (BORCLAR-MADDIOZSER-RULES)
PARMGROUP:  BORCLAR-MADDIOZSER-PARMS
PARENTS:  (KREDI-ANALIZ-ROOT)
PROMPTEVER:  (BORCLAR MADDI OZSERMAYE ORAN PUANI)
INITIALDATA:  (BOR-GEC)

BORMADDI-END [FRAMETYPES]
------------
TRANSLATION:  (BORCLAR MADDI OZSERMAYE ORANINI ETKILEYEN FAKTORLER END.
              STANDARTLARINA GORE)
IDENTIFIER:  "BORMADDI-END-"
RULEGROUPS:  (BORMADDI-END-RULES)
PARMGROUP:  BORMADDI-END-PARMS
PARENTS:  (BORCLAR-MADDIOZSER KREDI-ANALIZ-ROOT)
PROMPTEVER:  (BORCLAR / MADDI OZSERMAYE ORANINI ETKILEYEN FAKTORLER)
INITIALDATA:  (URET-MAL-HIZMET)

BRSATISKARI-NETSATIS [FRAMETYPES]
--------------------
TRANSLATION:  (BRUT SATIS KARI NET SATISLAR)
IDENTIFIER:  "BRSATISKARI-NETSATIS-"
RULEGROUPS:  (BRSATISKARI-NETSATIS-RULES)
PARMGROUP:  BRSATISKARI-NETSATIS-PARMS
PARENTS:  (KREDI-ANALIZ-ROOT)
PROMPTEVER:  (BRUT SATIS KARI NET SATISLAR ORANI)
INITIALDATA:  (BRUT-SATIS)

CARI-ORAN [FRAMETYPES]
---------
TRANSLATION:  (CARI ORAN)
OFFSPRING:  (CARI-ORAN-END> CARI-ORAN-END<= CARI-ORAN-GECMIS>
            CARI-ORAN-GECMIS<=)
IDENTIFIER:  "CARI-ORAN-"
RULEGROUPS:  (CARI-ORAN-RULES)
PARMGROUP:  CARI-ORAN-PARMS
PARENTS:  (KREDI-ANALIZ-ROOT)
PROMPTEVER:  (CARI ORANIN BULUNMASI)
INITIALDATA:  (DONER-DEGER CARI-END CARI-GECMIS)
```

```
CARI-ORAN-END<= [FRAMETYPES]
---------------
TRANSLATION:  (CARI ORANI ETKILEYEN FAKTORLERIN BULUNMASI
                (HESAPLANAN ORAN <= ENDUSTRI STANDARTI))
IDENTIFIER:  "CARI-ORAN-END<=-"
RULEGROUPS:  (CARI-ORAN-END<=-RULES)
PARMGROUP:  CARI-ORAN-END<=-PARMS
PARENTS:  (CARI-ORAN KREDI-ANALIZ-ROOT)
PROMPTEVER:  (CARI ORANI ETKILEYEN FAKTORLER
               (HESAPLANAN ORAN <= ENDUSTRI STANDARTI))

CARI-ORAN-END> [FRAMETYPES]
--------------
TRANSLATION:  (CARI ORANI ETKILEYEN FAKTORLERIN BULUNMASI
                (HESAPLANAN ORAN > ENDUSTRI STANDARTI))
IDENTIFIER:  "CARI-ORAN-END>-"
RULEGROUPS:  (CARI-ORAN-END>-RULES)
PARMGROUP:  CARI-ORAN-END>-PARMS
PARENTS:  (CARI-ORAN KREDI-ANALIZ-ROOT)
PROMPTEVER:  (CARI ORANI ETKILEYEN FAKTORLER
               (HESAPLANAN ORAN > ENDUSTRI STANDARTI))

CARI-ORAN-GECMIS<= [FRAMETYPES]
-----------------
TRANSLATION:  (CARI ORANI ETKILEYEN FAKTORLERIN BULUNMASI
                (HESAPLANAN ORAN <= GECMIS YIL))
IDENTIFIER:  "CARI-ORAN-GECMIS<=-"
RULEGROUPS:  (CARI-ORAN-GECMIS<=-RULES)
PARMGROUP:  CARI-ORAN-GECMIS<=-PARMS
PARENTS:  (CARI-ORAN KREDI-ANALIZ-ROOT)
PROMPTEVER:  (CARI ORANI ETKILEYEN FAKTORLERIN BULUNMASI
               (HESAPLANAN ORAN <= GECMIS YIL))

CARI-ORAN-GECMIS> [FRAMETYPES]
-----------------
TRANSLATION:  (CARI ORANI ETKILEYEN FAKTORLERIN BULUNMASI
                (HESAPLANAN ORAN > GECMIS YIL))
IDENTIFIER:  "CARI-ORAN-GECMIS>-"
RULEGROUPS:  (CARI-ORAN-GECMIS>-RULES)
PARMGROUP:  CARI-ORAN-GECMIS>-PARMS
PARENTS:  (CARI-ORAN KREDI-ANALIZ-ROOT)
PROMPTEVER:  (CARI ORANI ETKILEYEN FAKTORLERIN BULUNMASI
               (HESAPLANAN ORAN > GECMIS YIL))

FAALIYET-KARI [FRAMETYPES]
-------------
TRANSLATION:  (FAALIYET KARI)
OFFSPRING:  (FAALIYET-KARI-END)
IDENTIFIER:  "FAALIYET-KARI-"
RULEGROUPS:  (FAALIYET-KARI-RULES)
PARMGROUP:  FAALIYET-KARI-PARMS
```

```
PARENTS:  (KREDI-ANALIZ-ROOT)
PROMPTEVER:  (FAALIYET KARI PUANI)
INITIALDATA:  (FAAL-KAR)

FAALIYET-KARI-END [FRAMETYPES]
------------------
TRANSLATION:  (FAALIYET KARI PUANINI ETKILEYEN FAKTORLER)
IDENTIFIER:  "FAALIYET-KARI-END-"
RULEGROUPS:  (FAALIYET-KARI-END-RULES)
PARMGROUP:  FAALIYET-KARI-END-PARMS
PARENTS:  (FAALIYET-KARI KREDI-ANALIZ-ROOT)
PROMPTEVER:  (FAALIYET KARI PUANINI ETKILEYEN FAKTORLERIN HESAPLANMASI)
INITIALDATA:  (SATIS-FIYATI-ARTISI SATILAN-MAL-MALIYETI SATILAN-MAL-BILESIMI)

FVOK-AKTIFLER [FRAMETYPES]
-------------
TRANSLATION:  (FAIZ VERGIDEN ONCEKI KAZANC AKTIFLER ORANI)
IDENTIFIER:  "FVOK-AKTIFLER-"
RULEGROUPS:  (FVOK-AKTIFLER-RULES)
PARMGROUP:  FVOK-AKTIFLER-PARMS
PARENTS:  (KREDI-ANALIZ-ROOT)
PROMPTEVER:  (FVOK AKTIFLER ORAN PUANI)
INITIALDATA:  (FVOK)

KISAVADBORC-AKTIFLER [FRAMETYPES]
--------------------
TRANSLATION:  (KISA VADELI BORCLAR AKTIF TOPLAMI ORANI)
IDENTIFIER:  "KISAVADBORC-AKTIFLER-"
RULEGROUPS:  (KISAVADBORC-AKTIFLER-RULES)
PARMGROUP:  KISAVADBORC-AKTIFLER-PARMS
PARENTS:  (KREDI-ANALIZ-ROOT)
PROMPTEVER:  (KISA VADELI BORCLAR AKTIF TOPLAMI ORAN PUANI)
INITIALDATA:  (KISA-GEC)

KREDI-ANALIZ-ROOT [FRAMETYPES]
-----------------
TRANSLATION:  (KREDI ANALIZI)
OFFSPRING:  (CARI-ORAN LIKIDITE-ORAN ALACAK-DEVIR-HIZI STOK-DEVIR-HIZI
             OZSERMAYE-DEVIR-HIZI AKTIF-DEVIR-HIZI BORCLAR-MADDIOZSER
             MADDI-SABITLER KISAVADBORC-AKTIFLER BORCLAR-AKTIFLER FVOK-AKTIFLER
             BILANCO-KAR-NET NETKAR-NETSATISLAR BRSATISKARI-NETSATIS
             NETKAR-OZSER FAALIYET-KARI)
IDENTIFIER:  "KREDI-ANALIZ-ROOT-"
RULEGROUPS:  (KREDI-ANALIZ-ROOT-RULES)
PARMGROUP:  KREDI-ANALIZ-ROOT-PARMS
PROMPTEVER:  (This is KREDI ANALIZI)
DISPLAYRESULTS:  #T
GOALS:  (TOPLAM-PUAN)
INITIALDATA:  (KREDI-TIPI)
```

```
LIKIDITE-ORAN [FRAMETYPES]
--------------
TRANSLATION:  (LIKIDITE ORANI)
IDENTIFIER:  "LIKIDITE-ORAN-"
RULEGROUPS:  (LIKIDITE-ORAN-RULES)
PARMGROUP:  LIKIDITE-ORAN-PARMS
PARENTS:  (KREDI-ANALIZ-ROOT)
PROMPTEVER:  (LIKIDITE ORANI)
INITIALDATA:  (KASA BANKALAR TAHVILLER ALACAKLAR)

MADDI-SABITLER [FRAMETYPES]
---------------
TRANSLATION:  (MADDI SABIT DEGERLER / MADDI OZSERMAYE ORANI)
IDENTIFIER:  "MADDI-SABITLER-"
RULEGROUPS:  (MADDI-SABITLER-RULES)
PARMGROUP:  MADDI-SABITLER-PARMS
PARENTS:  (KREDI-ANALIZ-ROOT)
PROMPTEVER:  (MADDI SABIT DEGERLER MADDI OZSERMAYE ORAN PUANI)
INITIALDATA:  (MADSAB-GEC)

NETKAR-NETSATISLAR [FRAMETYPES]
-------------------
TRANSLATION:  (NET KAR NET SATISLAR ORANI)
IDENTIFIER:  "NETKAR-NETSATISLAR-"
RULEGROUPS:  (NETKAR-NETSATISLAR-RULES)
PARMGROUP:  NETKAR-NETSATISLAR-PARMS
PARENTS:  (KREDI-ANALIZ-ROOT)
PROMPTEVER:  (NET KAR NET SATISLAR ORANI PUANI)
INITIALDATA:  (NET-KAR NET-KAR-END NET-KAR-GEC)

NETKAR-OZSER [FRAMETYPES]
------------
TRANSLATION:  (NET KAR OZ SERMAYE ORANI)
IDENTIFIER:  "NETKAR-OZSER-"
RULEGROUPS:  (NETKAR-OZSER-RULES)
PARMGROUP:  NETKAR-OZSER-PARMS
PARENTS:  (KREDI-ANALIZ-ROOT)
PROMPTEVER:  (NET KAR OZ SERMAYE ORAN PUANI)
INITIALDATA:  (OZSER)

ODHP-END [FRAMETYPES]
--------
TRANSLATION:  (OZ SERMAYE DEVIR HIZINI ETKILEYEN FAKTORLERIN HESAPLANMASI)
IDENTIFIER:  "ODHP-END-"
RULEGROUPS:  (ODHP-END-RULES)
PARMGROUP:  ODHP-END-PARMS
PARENTS:  (OZSERMAYE-DEVIR-HIZI KREDI-ANALIZ-ROOT)
PROMPTEVER:  (OZ SERMAYE DEVIR HIZINI ETKILEYEN FAKTORLERIN HESAPLANMASI
               (END. STANDARTINDA))
```

```
OZSERMAYE-DEVIR-HIZI [FRAMETYPES]
---------------------
TRANSLATION:  (OZSERMAYE DEVIR HIZI PUANI)
OFFSPRING:  (ODHP-END)
IDENTIFIER:  "OZSERMAYE-DEVIR-HIZI-"
RULEGROUPS:  (OZSERMAYE-DEVIR-HIZI-RULES)
PARMGROUP:  OZSERMAYE-DEVIR-HIZI-PARMS
PARENTS:  (KREDI-ANALIZ-ROOT)
PROMPTEVER:  (OZSERMAYE DEVIR HIZI PUANI)
INITIALDATA:  (ORTALAMA-OZSERMAYE)

SDH-END< [FRAMETYPES]
--------
TRANSLATION:  (STOK DEVIR HIZINI ETKILEYEN FAKTORLER
                (SDH < END. STANDARTI))
IDENTIFIER:  "SDH-END<-"
RULEGROUPS:  (SDH-END<-RULES)
PARMGROUP:  SDH-END<-PARMS
PARENTS:  (STOK-DEVIR-HIZI KREDI-ANALIZ-ROOT)
PROMPTEVER:  (STOK DEVIR HIZINI ETKILEYEN FAKTORLER
               (SDH < END. STANDARTI))

SDH-END>= [FRAMETYPES]
---------
TRANSLATION:  (STOK DEVIR HIZINI ETKILEYEN FAKTORLER
                (SDH >= END. STANDARTI))
IDENTIFIER:  "SDH-END>=-"
RULEGROUPS:  (SDH-END>=-RULES)
PARMGROUP:  SDH-END>=-PARMS
PARENTS:  (STOK-DEVIR-HIZI KREDI-ANALIZ-ROOT)
PROMPTEVER:  (STOK DEVIR HIZINI ETKILEYEN FAKTORLER
               (SDH >= END. STANDARTI))

STOK-DEVIR-HIZI [FRAMETYPES]
---------------
TRANSLATION:  (STOK DEVIR HIZI)
OFFSPRING:  (SDH-END>= SDH-END<)
IDENTIFIER:  "STOK-DEVIR-HIZI-"
RULEGROUPS:  (STOK-DEVIR-HIZI-RULES)
PARMGROUP:  STOK-DEVIR-HIZI-PARMS
PARENTS:  (KREDI-ANALIZ-ROOT)
PROMPTEVER:  (STOK DEVIR HIZI)
INITIALDATA:  (SATILAN-MALIN-MALIYETI ORTALAMA-STOK SDH-END SDH-GEC)
```

Parameter Group FVOK-AKTIFLER-PARMS

```
FVOK [FVOK-AKTIFLER-PARMS]
----
TRANSLATION:  (FAIZ VERGIDEN ONCEKI KAZANC)
PROMPT:  #T
TYPE:  SINGLEVALUED
EXPECT:  POSITIVE-NUMBER
USED-BY:  RULE176 RULE177 RULE178 RULE179 RULE180

FVOK-END [FVOK-AKTIFLER-PARMS]
--------
TRANSLATION:  (FVOK END. STANDARTI)
PROMPT:  #T
TYPE:  SINGLEVALUED
EXPECT:  POSITIVE-NUMBER
USED-BY:  RULE176 RULE177 RULE178

FVOK-END-P [FVOK-AKTIFLER-PARMS]
----------
TRANSLATION:  (FVOK END. STANDART PUANI)
CONTAINED-IN:  (RULE175 RULE174)
TYPE:  SINGLEVALUED
EXPECT:  POSITIVE-NUMBER
RANGE:  (1. 3.)
UPDATED-BY:  RULE176 RULE177 RULE178

FVOK-GEC [FVOK-AKTIFLER-PARMS]
--------
TRANSLATION:  (FVOK GECMIS YIL ORANI)
PROMPT:  #T
TYPE:  SINGLEVALUED
EXPECT:  POSITIVE-NUMBER
USED-BY:  RULE179 RULE180

FVOK-GEC-P [FVOK-AKTIFLER-PARMS]
----------
TRANSLATION:  (FVOK GECMIS YIL PUANI)
CONTAINED-IN:  (RULE175 RULE174)
DEFAULT:  (VALUE 2)
TYPE:  SINGLEVALUED
EXPECT:  POSITIVE-NUMBER
RANGE:  (1. 3.)
UPDATED-BY:  RULE179 RULE180

KAR-DAGITIMI [FVOK-AKTIFLER-PARMS]
------------
TRANSLATION:  (KAR DAGITIM POLITIKASI)
```

```
PROMPT:  #T
TYPE:  SINGLEVALUED
EXPECT:  (IYI KOTU)
USED-BY:  RULE176 RULE177 RULE178
```

Parameter Group KISAVADBORC-AKTIFLER-PARMS

```
KISA-END-P [KISAVADBORC-AKTIFLER-PARMS]
----------
TRANSLATION:  (KISA VADELI BORCLAR AKTIF TOPLAMI PUANI
                (END. STANDARTINA GORE))
CONTAINED-IN:  (RULE159 RULE158)
DEFAULT:  (VALUE 2)
TYPE:  SINGLEVALUED
EXPECT:  POSITIVE-NUMBER
RANGE:  (1. 3.)
UPDATED-BY:  RULE160 RULE161 RULE162

KISA-GEC [KISAVADBORC-AKTIFLER-PARMS]
--------
TRANSLATION:  (KISA VADELI BORCLAR AKTIF TOPLAMI GECMIS YIL ORANI)
PROMPT:  #T
TYPE:  SINGLEVALUED
EXPECT:  POSITIVE-NUMBER
USED-BY:  RULE164 RULE163

KISA-GEC-P [KISAVADBORC-AKTIFLER-PARMS]
----------
TRANSLATION:  (KISA VADELI BORCLAR AKTIF TOPLAMI PUANI
                (GECMIS YILA GORE))
CONTAINED-IN:  (RULE159 RULE158)
DEFAULT:  (VALUE 2)
TYPE:  SINGLEVALUED
EXPECT:  POSITIVE-NUMBER
RANGE:  (1. 3.)
UPDATED-BY:  RULE164 RULE163
```

Parameter Group KREDI-ANALIZ-ROOT-PARMS

```
ADHP [KREDI-ANALIZ-ROOT-PARMS]
----
TRANSLATION:  (ALACAK DEVIR HIZI PUANI)
CONTAINED-IN:  (RULE005 RULE006)
TYPE:  SINGLEVALUED
EXPECT:  POSITIVE-NUMBER
RANGE:  (1. 3.)
USED-BY:  RULE033 RULE034 RULE035 RULE036 RULE037 RULE038 RULE039 RULE041
          RULE056 RULE057 RULE058 RULE148 RULE147 RULE149 RULE127 RULE129
          RULE126 RULE128
UPDATED-BY:  RULE081 RULE080

AKDHP [KREDI-ANALIZ-ROOT-PARMS]
-----
TRANSLATION:  (AKTIF DEVIR HIZI PUANI)
CONTAINED-IN:  (RULE005 RULE006)
TYPE:  SINGLEVALUED
EXPECT:  POSITIVE-NUMBER
RANGE:  (1. 3.)
UPDATED-BY:  RULE130 RULE131

AKTI-PUAN [KREDI-ANALIZ-ROOT-PARMS]
---------
TRANSLATION:  (AKTIVITE DURUM PUANI)
CONTAINED-IN:  (RULE002 RULE001)
TYPE:  SINGLEVALUED
EXPECT:  POSITIVE-NUMBER
RANGE:  (1. 3.)
UPDATED-BY:  RULE005 RULE006

AKTIF-TOPLAMI [KREDI-ANALIZ-ROOT-PARMS]
-------------
TRANSLATION:  (AKTIFLERIN TOPLAMI)
PROMPT:  #T
TYPE:  SINGLEVALUED
EXPECT:  POSITIVE-NUMBER
USED-BY:  RULE134 RULE135 RULE132 RULE133 RULE160 RULE161 RULE162 RULE164
          RULE163 RULE167 RULE168 RULE169 RULE170 RULE176 RULE177 RULE178
          RULE179 RULE180

BILANCOP [KREDI-ANALIZ-ROOT-PARMS]
--------
TRANSLATION:  (BILANCO KARI / NET SATISLAR)
CONTAINED-IN:  (RULE008 RULE007)
TYPE:  SINGLEVALUED
EXPECT:  POSITIVE-NUMBER
```

```
RANGE:  (1. 3.)
USED-BY:  RULE106 RULE105 RULE107 RULE109 RULE108
UPDATED-BY:  RULE181 RULE182

BORCAKP [KREDI-ANALIZ-ROOT-PARMS]
-------
TRANSLATION:  (BORCLAR / AKTIF TOPLAMI PUANI)
CONTAINED-IN:  (RULE010 RULE009)
TYPE:  SINGLEVALUED
EXPECT:  POSITIVE-NUMBER
RANGE:  (1. 3.)
UPDATED-BY:  RULE165 RULE166

BORCLAR [KREDI-ANALIZ-ROOT-PARMS]
-------
TRANSLATION:  (BORCLAR TOPLAMI)
PROMPT:  #T
TYPE:  SINGLEVALUED
EXPECT:  POSITIVE-NUMBER
USED-BY:  RULE138 RULE139 RULE151 RULE140 RULE141 RULE142 RULE143 RULE167
          RULE168 RULE169 RULE170 RULE150

BORCLARP [KREDI-ANALIZ-ROOT-PARMS]
--------
TRANSLATION:  (BORCLAR / MADDI OZ SERMAYE PUANI)
CONTAINED-IN:  (RULE010 RULE009 RULE118 RULE119)
TYPE:  SINGLEVALUED
EXPECT:  POSITIVE-NUMBER
RANGE:  (1. 3.)
UPDATED-BY:  RULE137 RULE136

BRUTKARP [KREDI-ANALIZ-ROOT-PARMS]
--------
TRANSLATION:  (BRUT SATIS KARI / NET SATISLAR)
CONTAINED-IN:  (RULE008 RULE007)
TYPE:  SINGLEVALUED
EXPECT:  POSITIVE-NUMBER
RANGE:  (1. 3.)
USED-BY:  RULE106 RULE105 RULE107 RULE109 RULE108
UPDATED-BY:  RULE194 RULE193

COP [KREDI-ANALIZ-ROOT-PARMS]
---
TRANSLATION:  (CARI ORAN PUANI)
CONTAINED-IN:  (RULE004 RULE003)
TYPE:  SINGLEVALUED
EXPECT:  POSITIVE-NUMBER
RANGE:  (1. 3.)
UPDATED-BY:  RULE019 RULE020
```

```
DONER-DEGER-LIKIDITE [KREDI-ANALIZ-ROOT-PARMS]
----------------------
TRANSLATION:  (DONER DEGERLER ICINDE LIKIDITESI YUKSEK OLANLARIN DIGERLERINE
              ORANI % OLARAK)
PROMPT:  #T
TYPE:  SINGLEVALUED
EXPECT:  POSITIVE-NUMBER
RANGE:  (1. 100.)
USED-BY:  RULE062 RULE063 RULE064 RULE065 RULE066 RULE067 RULE147 RULE149
          RULE172 RULE173 RULE171

ETKIN-TAHSILAT [KREDI-ANALIZ-ROOT-PARMS]
--------------
TRANSLATION:  (FIRMANIN TAHSILAT POLITIKASI)
PROMPT:  (FIRMANIN TAHSILAT POLITIKASI)
EXPECT:  (ETKIN ZAYIF)
TYPE:  SINGLEVALUED
USED-BY:  RULE089 RULE090 RULE091 RULE092 RULE093

FAALP [KREDI-ANALIZ-ROOT-PARMS]
-----
TRANSLATION:  (FAALIYET KARI PUANI)
CONTAINED-IN:  (RULE008 RULE007)
TYPE:  SINGLEVALUED
EXPECT:  POSITIVE-NUMBER
RANGE:  (1. 3.)
USED-BY:  RULE106 RULE105 RULE107 RULE109 RULE108
UPDATED-BY:  RULE205 RULE206

FIRMA-KURULUS [KREDI-ANALIZ-ROOT-PARMS]
-------------
TRANSLATION:  (FIRMA KURULUS ZAMANI)
PROMPT:  #T
TYPE:  SINGLEVALUED
EXPECT:  (ESKI YENI)
USED-BY:  RULE161 RULE162 RULE129 RULE126

FIRMA-SAHIBI-ALACAGI [KREDI-ANALIZ-ROOT-PARMS]
--------------------
TRANSLATION:  (FIRMANIN SAHIBINDEN ALACAGI)
PROMPT:  #T
TYPE:  YES/NO
USED-BY:  RULE074 RULE082

FIRMA-SAHIBI-ALACAGI-M [KREDI-ANALIZ-ROOT-PARMS]
----------------------
TRANSLATION:  (FIRMA SAHIBINDEN ALACAK MIKTARI)
PROMPT:  #T
DEFAULT:  (VALUE 0)
CONTAINED-IN:  (RULE074 RULE082)
TYPE:  SINGLEVALUED
```

```
EXPECT:  POSITIVE-NUMBER

FIRMA-TIPI [KREDI-ANALIZ-ROOT-PARMS]
----------
TRANSLATION:  (FIRMA TIPI)
PROMPT:  (FIRMA TIPI)
TYPE:  SINGLEVALUED
EXPECT:  (TEK-SAHIPLI ADI-OTAKLIK SAHIS-SIRKETI A.S. LTD.)
USED-BY:  RULE074 RULE082

FVOKP [KREDI-ANALIZ-ROOT-PARMS]
-----
TRANSLATION:  (FVOK / AKTIF PUANI)
CONTAINED-IN:  (RULE008 RULE007)
TYPE:  SINGLEVALUED
EXPECT:  POSITIVE-NUMBER
RANGE:  (1. 3.)
UPDATED-BY:  RULE175 RULE174

ISTIKRAR [KREDI-ANALIZ-ROOT-PARMS]
--------
TRANSLATION:  (SATISLAR ISTIKRARLIMI)
PROMPT:  (SATISLAR ISTIKRARLIMI)
EXPECT:  (ISTIKRARLI ISTIKRARSIZ)
TYPE:  SINGLEVALUED
USED-BY:  RULE050 RULE051 RULE052 RULE053 RULE054 RULE055 RULE144 RULE146

KAR-PUAN [KREDI-ANALIZ-ROOT-PARMS]
--------
TRANSLATION:  (KARLILIK PUANI)
CONTAINED-IN:  (RULE002 RULE001)
TYPE:  SINGLEVALUED
EXPECT:  POSITIVE-NUMBER
RANGE:  (1. 3.)
UPDATED-BY:  RULE008 RULE007

KISA-VAD-BORC [KREDI-ANALIZ-ROOT-PARMS]
-------------
TRANSLATION:  (KISA VADELI BORCLAR)
PROMPT:  (KISA VADELI BORCLAR)
TYPE:  SINGLEVALUED
EXPECT:  POSITIVE-NUMBER
USED-BY:  RULE023 RULE024 RULE025 RULE028 RULE029 RULE031 RULE032 RULE075
          RULE076 RULE079 RULE078 RULE022 RULE160 RULE161 RULE162 RULE164
          RULE163

KISABORCP [KREDI-ANALIZ-ROOT-PARMS]
---------
TRANSLATION:  (KISA VADELI BORCLAR / AKTIF TOPLAMI PUANI)
CONTAINED-IN:  (RULE010 RULE009)
TYPE:  SINGLEVALUED
```

```
EXPECT:  POSITIVE-NUMBER
RANGE:  (1. 3.)
UPDATED-BY:  RULE159 RULE158

KREDI-TIPI [KREDI-ANALIZ-ROOT-PARMS]
----------
TRANSLATION:  (KREDININ TIPI)
PROMPT:  (KREDI TIPI)
ASKFIRST:  #T
TYPE:  SINGLEVALUED
EXPECT:  (KISA-VADELI ORTA-VADELI)
USED-BY:  RULE002 RULE004 RULE005 RULE010 RULE009 RULE019 RULE020 RULE001
          RULE003 RULE073 RULE072 RULE081 RULE097 RULE098 RULE137 RULE136
          RULE153 RULE159 RULE165 RULE166 RULE152 RULE158 RULE175 RULE174
          RULE181 RULE182 RULE187 RULE188 RULE008 RULE007 RULE194 RULE193
          RULE200 RULE199 RULE205 RULE206 RULE080 RULE006 RULE130 RULE131
          RULE118 RULE119

LIKI-PUAN [KREDI-ANALIZ-ROOT-PARMS]
---------
TRANSLATION:  (LIKIDITE DURUM PUANI)
CONTAINED-IN:  (RULE002 RULE001)
TYPE:  SINGLEVALUED
EXPECT:  POSITIVE-NUMBER
RANGE:  (1. 3.)
UPDATED-BY:  RULE004 RULE003

LIKIP [KREDI-ANALIZ-ROOT-PARMS]
-----
TRANSLATION:  (LIKIDITE ORAN PUANI)
CONTAINED-IN:  (RULE004 RULE003)
TYPE:  SINGLEVALUED
EXPECT:  POSITIVE-NUMBER
RANGE:  (1. 3.)
UPDATED-BY:  RULE073 RULE072

MADDI-OZ [KREDI-ANALIZ-ROOT-PARMS]
--------
TRANSLATION:  (MADDI OZSERMAYE)
PROMPT:  #T
TYPE:  SINGLEVALUED
EXPECT:  POSITIVE-NUMBER
USED-BY:  RULE138 RULE139 RULE151 RULE140 RULE141 RULE142 RULE143 RULE154
          RULE155 RULE156 RULE150 RULE157

MADDI-SABIT [KREDI-ANALIZ-ROOT-PARMS]
-----------
TRANSLATION:  (MADDI SABIT DEGERLER)
PROMPT:  #T
TYPE:  SINGLEVALUED
EXPECT:  POSITIVE-NUMBER
```

```
USED-BY:  RULE154 RULE155 RULE156 RULE157

MADDISABP [KREDI-ANALIZ-ROOT-PARMS]
---------
TRANSLATION:  (MADDI SABIT DEGERLER / MADDI OZ SERMAYE PUANI)
CONTAINED-IN:  (RULE010 RULE009 RULE118 RULE119)
TYPE:  SINGLEVALUED
EXPECT:  POSITIVE-NUMBER
RANGE:  (1. 3.)
UPDATED-BY:  RULE153 RULE152

MALI-PUAN [KREDI-ANALIZ-ROOT-PARMS]
---------
TRANSLATION:  (MALI YAPI PUANI)
CONTAINED-IN:  (RULE002 RULE001)
TYPE:  SINGLEVALUED
EXPECT:  POSITIVE-NUMBER
RANGE:  (1. 3.)
UPDATED-BY:  RULE010 RULE009

MUBAYA-AVANS-M [KREDI-ANALIZ-ROOT-PARMS]
--------------
TRANSLATION:  (MUBAYA AVANS MIKTARI)
PROMPT:  (MUBAYA AVANS MIKTARI)
DEFAULT:  (VALUE 0)
CONTAINED-IN:  (RULE074 RULE082)
TYPE:  SINGLEVALUED
EXPECT:  POSITIVE-NUMBER

MUBAYA-AVANSI [KREDI-ANALIZ-ROOT-PARMS]
-------------
TRANSLATION:  (MUBAYA AVANSI)
PROMPT:  (MUBAYA AVANSI)
TYPE:  YES/NO
USED-BY:  RULE074 RULE082

NET-KAR [KREDI-ANALIZ-ROOT-PARMS]
-------
TRANSLATION:  (NET KAR)
PROMPT:  #T
TYPE:  SINGLEVALUED
EXPECT:  POSITIVE-NUMBER
USED-BY:  RULE189 RULE192 RULE191 RULE190 RULE202 RULE203 RULE204 RULE201

NET-SATISLAR [KREDI-ANALIZ-ROOT-PARMS]
------------
TRANSLATION:  (NET SATISLAR)
PROMPT:  #T
TYPE:  SINGLEVALUED
EXPECT:  POSITIVE-NUMBER
USED-BY:  RULE120 RULE121 RULE123 RULE124 RULE125 RULE134 RULE135 RULE132
```

```
          RULE133 RULE183 RULE184 RULE186 RULE185 RULE189 RULE192 RULE191
          RULE190 RULE198 RULE197 RULE196 RULE195 RULE209 RULE210 RULE211
          RULE212 RULE207 RULE208 RULE122

NETKAROZP [KREDI-ANALIZ-ROOT-PARMS]
---------
TRANSLATION:  (NET KAR / OZ SERMAYE ORANI PUANI)
CONTAINED-IN:  (RULE008 RULE007)
TYPE:  SINGLEVALUED
EXPECT:  POSITIVE-NUMBER
RANGE:  (1. 3.)
UPDATED-BY:  RULE200 RULE199

NETKARP [KREDI-ANALIZ-ROOT-PARMS]
-------
TRANSLATION:  (NET KAR / NET SATISLAR)
CONTAINED-IN:  (RULE008 RULE007)
TYPE:  SINGLEVALUED
EXPECT:  POSITIVE-NUMBER
RANGE:  (1. 3.)
UPDATED-BY:  RULE187 RULE188

ODHP [KREDI-ANALIZ-ROOT-PARMS]
----
TRANSLATION:  (OZ SERMAYE DEVIR HIZI PUANI)
CONTAINED-IN:  (RULE005 RULE006)
TYPE:  SINGLEVALUED
EXPECT:  POSITIVE-NUMBER
RANGE:  (1. 3.)
USED-BY:  RULE213 RULE214
UPDATED-BY:  RULE118 RULE119

REKABET [KREDI-ANALIZ-ROOT-PARMS]
-------
TRANSLATION:  (FIRMANIN PIYASA REKABETI)
PROMPT:  (FIRMANIN PIYASA REKABETI)
EXPECT:  (GUCLU GUCSUZ)
TYPE:  SINGLEVALUED
USED-BY:  RULE091 RULE092 RULE093 RULE115 RULE116 RULE117 RULE050 RULE051
          RULE052 RULE053 RULE054 RULE144 RULE146 RULE145

SATICI-AVANS-M [KREDI-ANALIZ-ROOT-PARMS]
--------------
TRANSLATION:  (SATICI AVANS MIKTARI)
PROMPT:  (SATICI AVANS MIKTARI)
DEFAULT:  (VALUE 0)
CONTAINED-IN:  (RULE074 RULE082)
TYPE:  SINGLEVALUED
EXPECT:  POSITIVE-NUMBER
```

```
SATICI-AVANSI [KREDI-ANALIZ-ROOT-PARMS]
---------------
TRANSLATION:  (SATICI AVANSI)
PROMPT:  (SATICI AVANSI)
TYPE:  YES/NO
USED-BY:  RULE074 RULE082

SDH-P1 [KREDI-ANALIZ-ROOT-PARMS]
------
TRANSLATION:  (STOK DEVIR HIZI PUANI ENDUSTRI STANDARTINA GORE)
DEFAULT:  (VALUE 2)
CONTAINED-IN:  (RULE103 RULE104)
TYPE:  SINGLEVALUED
EXPECT:  POSITIVE-NUMBER
RANGE:  (1. 3.)
USED-BY:  RULE127 RULE129 RULE126 RULE128
UPDATED-BY:  RULE102 RULE101

SDHP [KREDI-ANALIZ-ROOT-PARMS]
----
TRANSLATION:  (STOK DEVIR HIZI PUANI)
CONTAINED-IN:  (RULE005 RULE006)
TYPE:  SINGLEVALUED
EXPECT:  POSITIVE-NUMBER
RANGE:  (1. 3.)
USED-BY:  RULE050 RULE051 RULE052 RULE053 RULE054 RULE055
UPDATED-BY:  RULE097 RULE098

SUPHE-M [KREDI-ANALIZ-ROOT-PARMS]
-------
TRANSLATION:  (SUPHELI ALACAK MIKTARI)
PROMPT:  (SUPHELI ALACAK MIKTARI)
CONTAINED-IN:  (RULE021 RULE074 RULE082)
DEFAULT:  (VALUE 0)
TYPE:  SINGLEVALUED
EXPECT:  POSITIVE-NUMBER

SUPHELI-ALACAK [KREDI-ANALIZ-ROOT-PARMS]
--------------
TRANSLATION:  (SUPHELI ALACAK PASIFTE VARMI)
PROMPT:  (SUPHELI ALACAK PASIFTE VARMI)
TYPE:  YES/NO
USED-BY:  RULE021 RULE074 RULE082

TOPLAM-PUAN [KREDI-ANALIZ-ROOT-PARMS]
-----------
TRANSLATION:  (FIRMANIN TOPLAM PUANI)
EXPECT:  POSITIVE-NUMBER
RANGE:  (1. 3.)
UPDATED-BY:  RULE002 RULE001
```

Parameter Group LIKIDITE-ORAN-PARMS

```
ALACAKLAR [LIKIDITE-ORAN-PARMS]
---------
TRANSLATION:  (ALACAKLAR)
PROMPT:  (ALACAKLAR)
TYPE:  SINGLEVALUED
EXPECT:  POSITIVE-NUMBER
USED-BY:  RULE075 RULE076 RULE079 RULE078
UPDATED-BY:  RULE074

BANKALAR [LIKIDITE-ORAN-PARMS]
--------
TRANSLATION:  (BANKALAR)
PROMPT:  (BANKALAR)
TYPE:  SINGLEVALUED
EXPECT:  POSITIVE-NUMBER
USED-BY:  RULE075 RULE076 RULE079 RULE078

KASA [LIKIDITE-ORAN-PARMS]
----
TRANSLATION:  (KASA)
PROMPT:  (KASA)
TYPE:  SINGLEVALUED
EXPECT:  POSITIVE-NUMBER
USED-BY:  RULE075 RULE076 RULE079 RULE078

LIKI-END [LIKIDITE-ORAN-PARMS]
--------
TRANSLATION:  (LIKIDITE ORANININ ENDUSTRI STANDARTI)
PROMPT:  #T
TYPE:  SINGLEVALUED
EXPECT:  POSITIVE-NUMBER
USED-BY:  RULE075 RULE076

LIKI-END-P [LIKIDITE-ORAN-PARMS]
----------
TRANSLATION:  (ENDUSTRI STANDARTLARINA GORE LIKIDITE ORAN PUANI)
DEFAULT:  (VALUE 2)
CONTAINED-IN:  (RULE073 RULE072)
TYPE:  SINGLEVALUED
EXPECT:  POSITIVE-NUMBER
RANGE:  (1. 3.)
UPDATED-BY:  RULE075 RULE076

LIKI-GEC [LIKIDITE-ORAN-PARMS]
--------
TRANSLATION:  (GECMIS YIL LIKIDITE ORANI)
```

```
PROMPT:  #T
TYPE:  SINGLEVALUED
EXPECT:  POSITIVE-NUMBER
USED-BY:  RULE079 RULE078

LIKI-GEC-P [LIKIDITE-ORAN-PARMS]
----------
TRANSLATION:  (GECMIS YILA GORE LIKIDITE ORAN PUANI)
DEFAULT:  (VALUE 2)
CONTAINED-IN:  (RULE073 RULE072)
TYPE:  SINGLEVALUED
EXPECT:  POSITIVE-NUMBER
RANGE:  (1. 3.)
UPDATED-BY:  RULE079 RULE078

PESIN-GIDERLER [LIKIDITE-ORAN-PARMS]
--------------
TRANSLATION:  (PESIN GIDER VARMI)
PROMPT:  #T
TYPE:  YES/NO
USED-BY:  RULE074

PESIN-GIDERLER-M [LIKIDITE-ORAN-PARMS]
----------------
TRANSLATION:  (PESIN GIDER MIKTARI)
PROMPT:  #T
DEFAULT:  (VALUE 0)
CONTAINED-IN:  (RULE074)
TYPE:  SINGLEVALUED
EXPECT:  POSITIVE-NUMBER

TAHVILLER [LIKIDITE-ORAN-PARMS]
---------
TRANSLATION:  (TAHVILLER)
PROMPT:  (TAHVILLER)
TYPE:  SINGLEVALUED
EXPECT:  POSITIVE-NUMBER
USED-BY:  RULE075 RULE076 RULE079 RULE078
```

Parameter Group MADDI-SABITLER-PARMS

```
MADSAB-END-P [MADDI-SABITLER-PARMS]
------------
TRANSLATION:  (MADDI SABIT DEGERLER MADDI OZSERMAYE PUANI
                (END. STANDARTINA GORE))
```

```
DEFAULT:  (VALUE 2)
CONTAINED-IN:  (RULE153 RULE152)
TYPE:  SINGLEVALUED
EXPECT:  POSITIVE-NUMBER
RANGE:  (1. 3.)
UPDATED-BY:  RULE156 RULE157

MADSAB-GEC [MADDI-SABITLER-PARMS]
----------
TRANSLATION:  (GECMIS YIL MADDI SABIT DEGERLER MADDI OZSERMAYE ORANI)
PROMPT:  #T
TYPE:  SINGLEVALUED
EXPECT:  POSITIVE-NUMBER
USED-BY:  RULE154 RULE155

MADSAB-GEC-P [MADDI-SABITLER-PARMS]
------------
TRANSLATION:  (MADDI SABIT DEGERLER MADDI OZSERMAYE PUANI
                (GECMIS YILA GORE))
DEFAULT:  (VALUE 2)
CONTAINED-IN:  (RULE153 RULE152)
TYPE:  SINGLEVALUED
EXPECT:  POSITIVE-NUMBER
RANGE:  (1. 3.)
UPDATED-BY:  RULE154 RULE155

SABIT-DEGER-ALIYOR [MADDI-SABITLER-PARMS]
------------------
TRANSLATION:  (MADDI SABIT DEGER SATIN ALIYOR)
PROMPT:  #T
TYPE:  YES/NO
USED-BY:  RULE157
```

Parameter Group NETKAR-NETSATISLAR-PARMS

```
NET-KAR-END [NETKAR-NETSATISLAR-PARMS]
-----------
TRANSLATION:  (NET KAR NET SATISLAR ORANI END. STANDARTINA GORE)
PROMPT:  #T
TYPE:  SINGLEVALUED
EXPECT:  POSITIVE-NUMBER
USED-BY:  RULE189 RULE190

NET-KAR-END-P [NETKAR-NETSATISLAR-PARMS]
-------------
```

```
TRANSLATION:  (NET KAR ORANI PUANI END. STANDARTINA GORE)
CONTAINED-IN:  (RULE187 RULE188)
DEFAULT:  (VALUE 2)
TYPE:  SINGLEVALUED
EXPECT:  POSITIVE-NUMBER
RANGE:  (1. 3.)
UPDATED-BY:  RULE189 RULE190

NET-KAR-GEC [NETKAR-NETSATISLAR-PARMS]
-----------
TRANSLATION:  (NET KAR NET SATISLAR ORANI GECMIS YILA GORE)
PROMPT:  #T
TYPE:  SINGLEVALUED
EXPECT:  POSITIVE-NUMBER
USED-BY:  RULE192 RULE191

NET-KAR-GEC-P [NETKAR-NETSATISLAR-PARMS]
-------------
TRANSLATION:  (NET KAR ORAN PUANI GECMIS YILA GORE)
CONTAINED-IN:  (RULE187 RULE188)
DEFAULT:  (VALUE 2)
TYPE:  SINGLEVALUED
EXPECT:  POSITIVE-NUMBER
RANGE:  (1. 3.)
UPDATED-BY:  RULE192 RULE191
```

Parameter Group NETKAR-OZSER-PARMS

```
NETOZ-END [NETKAR-OZSER-PARMS]
---------
TRANSLATION:  (NET KAR OZ SERMAYE END. STANDARTI)
PROMPT:  #T
TYPE:  SINGLEVALUED
EXPECT:  POSITIVE-NUMBER
USED-BY:  RULE202 RULE201

NETOZ-END-P [NETKAR-OZSER-PARMS]
-----------
TRANSLATION:  (NET KAR OZ SERMAYE ORANI PUANI END. STANDARTINA GORE)
CONTAINED-IN:  (RULE200 RULE199)
DEFAULT:  (VALUE 2)
TYPE:  SINGLEVALUED
EXPECT:  POSITIVE-NUMBER
RANGE:  (1. 3.)
UPDATED-BY:  RULE202 RULE201
```

```
NETOZ-GEC [NETKAR-OZSER-PARMS]
---------
TRANSLATION:  (NET KAR OZ SERMAYE ORANI GECMIS YILA GORE)
PROMPT:  #T
TYPE:  SINGLEVALUED
EXPECT:  POSITIVE-NUMBER
USED-BY:  RULE203 RULE204

NETOZ-GEC-P [NETKAR-OZSER-PARMS]
-----------
TRANSLATION:  (NET KAR OZ SERMAYE ORAN PUANI GECMIS YILA GORE)
CONTAINED-IN:  (RULE200 RULE199)
DEFAULT:  (VALUE 2)
TYPE:  SINGLEVALUED
EXPECT:  POSITIVE-NUMBER
RANGE:  (1. 3.)
UPDATED-BY:  RULE203 RULE204

OZSER [NETKAR-OZSER-PARMS]
-----
TRANSLATION:  (OZ SERMAYE)
PROMPT:  #T
TYPE:  SINGLEVALUED
EXPECT:  POSITIVE-NUMBER
USED-BY:  RULE202 RULE203 RULE204 RULE201
```

Parameter Group ODHP-END-PARMS

No parameters defined

Parameter Group OZSERMAYE-DEVIR-HIZI-PARMS

```
ORTALAMA-OZSERMAYE [OZSERMAYE-DEVIR-HIZI-PARMS]
------------------
TRANSLATION:  (ORTALAMA OZSERMAYE)
PROMPT:  #T
TYPE:  SINGLEVALUED
EXPECT:  POSITIVE-NUMBER
USED-BY:  RULE120 RULE121 RULE123 RULE124 RULE125 RULE122

OZSER-END [OZSERMAYE-DEVIR-HIZI-PARMS]
---------
```

```
TRANSLATION:  (OZSERMAYE DEVIR HIZININ ENDUSTRI STANDARTI)
PROMPT:  #T
TYPE:  SINGLEVALUED
EXPECT:  POSITIVE-NUMBER
USED-BY:  RULE123 RULE124 RULE125 RULE122

OZSER-END-P [OZSERMAYE-DEVIR-HIZI-PARMS]
----------
TRANSLATION:  (OZSERMAYE DEVIR HIZININ ENDUSTRI STANDARTINA GORE PUANI
                (ETKILEYEN FAKTORLERDEN SONRA))
CONTAINED-IN:  (RULE118 RULE119)
TYPE:  SINGLEVALUED
EXPECT:  POSITIVE-NUMBER
RANGE:  (1. 3.)
UPDATED-BY:  RULE123 RULE122

OZSER-GEC [OZSERMAYE-DEVIR-HIZI-PARMS]
---------
TRANSLATION:  (GECMIS YIL OZSERMAYE DEVIR HIZI)
PROMPT:  #T
TYPE:  SINGLEVALUED
EXPECT:  POSITIVE-NUMBER
USED-BY:  RULE120 RULE121

OZSER-GEC-P [OZSERMAYE-DEVIR-HIZI-PARMS]
-----------
TRANSLATION:  (OZSERMAYE DEVIR HIZININ GECMIS YILA GORE PUANI)
DEFAULT:  (VALUE 2)
CONTAINED-IN:  (RULE118 RULE119)
TYPE:  SINGLEVALUED
EXPECT:  POSITIVE-NUMBER
RANGE:  (1. 3.)
UPDATED-BY:  RULE120 RULE121

OZSER1 [OZSERMAYE-DEVIR-HIZI-PARMS]
------
TRANSLATION:  (OZSERMAYE DEVIR HIZININ ENDUSTRI STANDARTINA GORE PUANI)
DEFAULT:  (VALUE 2)
CONTAINED-IN:  (RULE123 RULE122)
TYPE:  SINGLEVALUED
EXPECT:  POSITIVE-NUMBER
RANGE:  (1. 3.)
UPDATED-BY:  RULE124 RULE125

OZSERX1 [OZSERMAYE-DEVIR-HIZI-PARMS]
-------
TRANSLATION:  (STOK DEVIR HIZI,ALACAK DEVIR HIZI,FIRMANIN KURULUS ZAMANI
               FAKTORLERI)
DEFAULT:  (VALUE 2)
CONTAINED-IN:  (RULE123 RULE122)
TYPE:  SINGLEVALUED
```

EXPECT: POSITIVE-NUMBER
RANGE: (1. 3.)
UPDATED-BY: RULE127 RULE129 RULE126 RULE128

Parameter Group SDH-END<-PARMS

EMNIYET-STOGU [SDH-END<-PARMS]

TRANSLATION: (EMNIYET STOGU)
PROMPT: #T
TYPE: SINGLEVALUED
EXPECT: (YUKSEK DUSUK)
USED-BY: RULE113 RULE114

STOK-KALITESI [SDH-END<-PARMS]

TRANSLATION: (STOK KALITESI)
PROMPT: #T
TYPE: SINGLEVALUED
EXPECT: (IYI KOTU)
USED-BY: RULE113 RULE114

STOKLARA-YATIRIM [SDH-END<-PARMS]

TRANSLATION: (STOKLARA YATIRIM)
PROMPT: #T
TYPE: SINGLEVALUED
EXPECT: (COK AZ)
USED-BY: RULE113 RULE114

TUKE-ZEVK [SDH-END<-PARMS]

TRANSLATION: (TUKETICI ZEVK DEGISIMI)
PROMPT: #T
TYPE: SINGLEVALUED
EXPECT: (YOK VAR)
USED-BY: RULE116 RULE117

Parameter Group SDH-END>=-PARMS

```
STOKLAR-YENILENMESI [SDH-END>=-PARMS]
-------------------
TRANSLATION:  (STOKLARIN YENILENMESI)
PROMPT:  #T
TYPE:  YES/NO
USED-BY:  RULE111 RULE112

STOKLAR-YETER [SDH-END>=-PARMS]
-------------
TRANSLATION:  (STOKLAR YETERLIMI)
PROMPT:  #T
TYPE:  YES/NO
USED-BY:  RULE110 RULE111 RULE112
```

Parameter Group STOK-DEVIR-HIZI-PARMS

```
ORTALAMA-STOK [STOK-DEVIR-HIZI-PARMS]
-------------
TRANSLATION:  (ORTALAMA STOK
                (DONEM BASI + DONEM SONU / 2))
PROMPT:  #T
TYPE:  SINGLEVALUED
EXPECT:  POSITIVE-NUMBER
USED-BY:  RULE100 RULE099 RULE102 RULE101 RULE103 RULE104

SATILAN-MALIN-MALIYETI [STOK-DEVIR-HIZI-PARMS]
----------------------
TRANSLATION:  (SATILAN MALIN MALIYETI)
PROMPT:  #T
TYPE:  SINGLEVALUED
EXPECT:  POSITIVE-NUMBER
USED-BY:  RULE100 RULE099 RULE102 RULE101 RULE103 RULE104

SDH-END [STOK-DEVIR-HIZI-PARMS]
-------
TRANSLATION:  (STOK DEVIR HIZI ENDUSTRI STANDARTI)
PROMPT:  #T
TYPE:  SINGLEVALUED
EXPECT:  POSITIVE-NUMBER
USED-BY:  RULE102 RULE101 RULE103 RULE104
```

```
SDH-END-P [STOK-DEVIR-HIZI-PARMS]
---------
TRANSLATION:  (ENDUSTRI STANDARTINA GORE SOK DEVIR HIZI PUANI ETKILEYEN
              FAKTORLERDEN SONRA)
CONTAINED-IN:  (RULE097 RULE098)
TYPE:  SINGLEVALUED
EXPECT:  POSITIVE-NUMBER
RANGE:  (1. 3.)
UPDATED-BY:  RULE103 RULE104

SDH-GEC [STOK-DEVIR-HIZI-PARMS]
-------
TRANSLATION:  (GECMIS YIL STOK DEVIR HIZI)
PROMPT:  #T
TYPE:  SINGLEVALUED
EXPECT:  POSITIVE-NUMBER
USED-BY:  RULE100 RULE099

SDH-GEC-P [STOK-DEVIR-HIZI-PARMS]
---------
TRANSLATION:  (GECMIS YILA GORE STOK DEVIR HIZI PUANI)
DEFAULT:  (VALUE 2)
CONTAINED-IN:  (RULE097 RULE098)
TYPE:  SINGLEVALUED
EXPECT:  POSITIVE-NUMBER
RANGE:  (1. 3.)
UPDATED-BY:  RULE100 RULE099

SDHX1 [STOK-DEVIR-HIZI-PARMS]
-----
TRANSLATION:  (FAALIYET KAR PUANI,BRUT SATIS KAR PUANI,BILANCO KAR PUANI NET
              KAR PUANI FAKTORLERI
                (SDH >= END. STANDARTI))
DEFAULT:  (VALUE 2)
CONTAINED-IN:  (RULE103)
TYPE:  SINGLEVALUED
EXPECT:  POSITIVE-NUMBER
RANGE:  (1. 3.)
UPDATED-BY:  RULE106 RULE105 RULE107 RULE109 RULE108

SDHX2 [STOK-DEVIR-HIZI-PARMS]
-----
TRANSLATION:  (STOK YENILENMESI,STOKLARIN YETERLILIGI,REKABET FAKTORLERI
                (SDH >= END. STANDARTI))
DEFAULT:  (VALUE 2)
CONTAINED-IN:  (RULE103)
TYPE:  SINGLEVALUED
EXPECT:  POSITIVE-NUMBER
RANGE:  (1. 3.)
UPDATED-BY:  RULE110 RULE111 RULE112
```

```
SDHX3 [STOK-DEVIR-HIZI-PARMS]
-----
TRANSLATION:  (STOK KALITESI,EMNIYET STOGU,STOKLARA YATIRIM POLITIKASI
              FAKTORLERI
                (SDH < END. STANDARTI))
DEFAULT:  (VALUE 2)
CONTAINED-IN:  (RULE104)
TYPE:  SINGLEVALUED
EXPECT:  POSITIVE-NUMBER
RANGE:  (1. 3.)
UPDATED-BY:  RULE113 RULE114

SDHX4 [STOK-DEVIR-HIZI-PARMS]
-----
TRANSLATION:  (REKABET,TUKETICI ZEVKLERINDE DEGISIM FAKTORLERI
                (SDH < END. STANDARTI))
DEFAULT:  (VALUE 2)
CONTAINED-IN:  (RULE104)
TYPE:  SINGLEVALUED
EXPECT:  POSITIVE-NUMBER
RANGE:  (1. 3.)
UPDATED-BY:  RULE115 RULE116 RULE117
```

C. VARIABLES and SYSTEM PARAMETERS

VARIABLES

DOMAIN [VARIABLES]

VALUE: "KREDI-ANALIZ-1"

SYSTEM PARAMETERS (RULEGROUPS)

ADH-END<=-RULES [RULEGROUPS]

SVAL: (THE ADH-END<=)
FRAME: (ADH-END<=)
VALUE: RULE089 RULE090

ADH-END>-RULES [RULEGROUPS]

SVAL: (THE ADH-END>)
FRAME: (ADH-END>)
VALUE: RULE091 RULE092 RULE093

AKTIF-DEVIR-HIZI-RULES [RULEGROUPS]

SVAL: (THE AKTIF-DEVIR-HIZI)
FRAME: (AKTIF-DEVIR-HIZI)
VALUE: RULE130 RULE131 RULE132 RULE133 RULE134 RULE135

ALACAK-DEVIR-HIZI-RULES [RULEGROUPS]

SVAL: (THE ALACAK-DEVIR-HIZI)
FRAME: (ALACAK-DEVIR-HIZI)
VALUE: RULE080 RULE081 RULE082 RULE083 RULE084 RULE085 RULE086 RULE087
RULE088

ALACAK-ORTALAMA-TAH-RULES [RULEGROUPS]

SVAL: (THE ALACAK-ORTALAMA-TAH)
FRAME: (ALACAK-ORTALAMA-TAH)
VALUE: RULE094 RULE095 RULE096

BILANCO-KAR-NET-RULES [RULEGROUPS]

SVAL: (THE BILANCO-KAR-NET)
FRAME: (BILANCO-KAR-NET)
VALUE: RULE181 RULE182 RULE183 RULE184 RULE185 RULE186

```
BORCLAR-AKTIFLER-RULES [RULEGROUPS]
----------------------
SVAL:  (THE BORCLAR-AKTIFLER)
FRAME:  (BORCLAR-AKTIFLER)
VALUE:  RULE165 RULE166 RULE167 RULE168 RULE169 RULE170 RULE171 RULE172
        RULE173

BORCLAR-MADDIOZSER-RULES [RULEGROUPS]
------------------------
SVAL:  (THE BORCLAR-MADDIOZSER)
FRAME:  (BORCLAR-MADDIOZSER)
VALUE:  RULE136 RULE137 RULE138 RULE139 RULE140 RULE141 RULE142 RULE143

BORMADDI-END-RULES [RULEGROUPS]
------------------
SVAL:  (THE BORMADDI-END)
FRAME:  (BORMADDI-END)
VALUE:  RULE144 RULE145 RULE146 RULE147 RULE148 RULE149 RULE150 RULE151

BRSATISKARI-NETSATIS-RULES [RULEGROUPS]
--------------------------
SVAL:  (THE BRSATISKARI-NETSATIS)
FRAME:  (BRSATISKARI-NETSATIS)
VALUE:  RULE193 RULE194 RULE195 RULE196 RULE197 RULE198

CARI-ORAN-END<=-RULES [RULEGROUPS]
---------------------
SVAL:  (THE CARI-ORAN-END<=)
FRAME:  (CARI-ORAN-END<=)
VALUE:  RULE033 RULE034 RULE035 RULE036 RULE037 RULE038 RULE039 RULE041
        RULE042 RULE043 RULE044 RULE045 RULE046 RULE047 RULE048 RULE049
        RULE050 RULE051 RULE052 RULE062 RULE063 RULE064 RULE070 RULE071

CARI-ORAN-END>-RULES [RULEGROUPS]
--------------------
SVAL:  (THE CARI-ORAN-END>)
FRAME:  (CARI-ORAN-END>)
VALUE:  RULE053 RULE054 RULE055 RULE056 RULE057 RULE058 RULE059 RULE060
        RULE061 RULE065 RULE066 RULE067 RULE068 RULE069

CARI-ORAN-GECMIS<=-RULES [RULEGROUPS]
-----------------------
SVAL:  (THE CARI-ORAN-GECMIS<=)
FRAME:  (CARI-ORAN-GECMIS<=)
VALUE:  RULE011 RULE012 RULE013 RULE014

CARI-ORAN-GECMIS>-RULES [RULEGROUPS]
-----------------------
SVAL:  (THE CARI-ORAN-GECMIS>)
FRAME:  (CARI-ORAN-GECMIS>)
VALUE:  RULE015 RULE016 RULE017 RULE018
```

```
CARI-ORAN-RULES [RULEGROUPS]
---------------
SVAL:  (THE CARI-ORAN)
FRAME:  (CARI-ORAN)
VALUE:  RULE019 RULE020 RULE021 RULE022 RULE023 RULE024 RULE025 RULE028
        RULE029 RULE031 RULE032

FAALIYET-KARI-END-RULES [RULEGROUPS]
-----------------------
SVAL:  (THE FAALIYET-KARI-END)
FRAME:  (FAALIYET-KARI-END)
VALUE:  RULE213 RULE214 RULE215 RULE216 RULE217 RULE218

FAALIYET-KARI-RULES [RULEGROUPS]
-------------------
SVAL:  (THE FAALIYET-KARI)
FRAME:  (FAALIYET-KARI)
VALUE:  RULE205 RULE206 RULE207 RULE208 RULE209 RULE210 RULE211 RULE212

FVOK-AKTIFLER-RULES [RULEGROUPS]
-------------------
SVAL:  (THE FVOK-AKTIFLER)
FRAME:  (FVOK-AKTIFLER)
VALUE:  RULE174 RULE175 RULE176 RULE177 RULE178 RULE179 RULE180

KISAVADBORC-AKTIFLER-RULES [RULEGROUPS]
--------------------------
SVAL:  (THE KISAVADBORC-AKTIFLER)
FRAME:  (KISAVADBORC-AKTIFLER)
VALUE:  RULE158 RULE159 RULE160 RULE161 RULE162 RULE163 RULE164

KREDI-ANALIZ-ROOT-RULES [RULEGROUPS]
-----------------------
SVAL:  (THE KREDI-ANALIZ-ROOT)
FRAME:  (KREDI-ANALIZ-ROOT)
VALUE:  RULE001 RULE002 RULE003 RULE004 RULE005 RULE006 RULE007 RULE008
        RULE009 RULE010

LIKIDITE-ORAN-RULES [RULEGROUPS]
-------------------
SVAL:  (THE LIKIDITE-ORAN)
FRAME:  (LIKIDITE-ORAN)
VALUE:  RULE072 RULE073 RULE074 RULE075 RULE076 RULE078 RULE079

MADDI-SABITLER-RULES [RULEGROUPS]
--------------------
SVAL:  (THE MADDI-SABITLER)
FRAME:  (MADDI-SABITLER)
VALUE:  RULE152 RULE153 RULE154 RULE155 RULE156 RULE157
```

```
META-RULES [RULEGROUPS]
----------
VALUE:

NETKAR-NETSATISLAR-RULES [RULEGROUPS]
------------------------
SVAL:  (THE NETKAR-NETSATISLAR)
FRAME:  (NETKAR-NETSATISLAR)
VALUE:  RULE187 RULE188 RULE189 RULE190 RULE191 RULE192

NETKAR-OZSER-RULES [RULEGROUPS]
------------------
SVAL:  (THE NETKAR-OZSER)
FRAME:  (NETKAR-OZSER)
VALUE:  RULE199 RULE200 RULE201 RULE202 RULE203 RULE204

ODHP-END-RULES [RULEGROUPS]
--------------
SVAL:  (THE ODHP-END)
FRAME:  (ODHP-END)
VALUE:  RULE126 RULE127 RULE128 RULE129

OZSERMAYE-DEVIR-HIZI-RULES [RULEGROUPS]
--------------------------
SVAL:  (THE OZSERMAYE-DEVIR-HIZI)
FRAME:  (OZSERMAYE-DEVIR-HIZI)
VALUE:  RULE118 RULE119 RULE120 RULE121 RULE122 RULE123 RULE124 RULE125

SDH-END<-RULES [RULEGROUPS]
--------------
SVAL:  (THE SDH-END<)
FRAME:  (SDH-END<)
VALUE:  RULE113 RULE114 RULE115 RULE116 RULE117

SDH-END>=-RULES [RULEGROUPS]
---------------
SVAL:  (THE SDH-END>=)
FRAME:  (SDH-END>=)
VALUE:  RULE105 RULE106 RULE107 RULE108 RULE109 RULE110 RULE111 RULE112

STOK-DEVIR-HIZI-RULES [RULEGROUPS]
---------------------
SVAL:  (THE STOK-DEVIR-HIZI)
FRAME:  (STOK-DEVIR-HIZI)
VALUE:  RULE097 RULE098 RULE099 RULE100 RULE101 RULE102 RULE103 RULE104
```

ADH-END<=-PARMS [PARMGROUPS]

VALUE:

ADH-END>-PARMS [PARMGROUPS]

VALUE:

AKTIF-DEVIR-HIZI-PARMS [PARMGROUPS]

VALUE: AKDEV-END AKDEV-END-P AKDEV-GEC AKDEV-GEC-P

ALACAK-DEVIR-HIZI-PARMS [PARMGROUPS]

VALUE: ADH-END ADH-END-P ADH-GEC ADH-GEC-P ADH-P1 ADHX1 ADHX2 ATAHSIL-P
KREDILI-SATISLAR KREDILI-SATISLARDA-KISITLAYICI PERSONEL-ALACAGI
PERSONEL-ALACAK-M SABIT-DEGER-SATIS SABIT-DEGER-SATIS-M TICARI-ALACAK

ALACAK-ORTALAMA-TAH-PARMS [PARMGROUPS]

VALUE: GEC-ATAHSIL KENDI-VADESI

BILANCO-KAR-NET-PARMS [PARMGROUPS]

VALUE: BILAKAR-END BILAKAR-END-P BILAKAR-GEC BILAKAR-GEC-P BILANCO-KARI

BORCLAR-AKTIFLER-PARMS [PARMGROUPS]

VALUE: BORCAK-END-P BORCAK-GEC BORCAK-GEC-P LIKIDITE-ETKI

BORCLAR-MADDIOZSER-PARMS [PARMGROUPS]

VALUE: BOR-END-P BOR-GEC BOR-GEC-P BOR1 BORX1 BORX2 BORX3

BORMADDI-END-PARMS [PARMGROUPS]

VALUE: URET-MAL-HIZMET

BRSATISKARI-NETSATIS-PARMS [PARMGROUPS]

VALUE: BRKAR-END BRKAR-END-P BRKAR-GEC BRKAR-GEC-P BRUT-SATIS

CARI-ORAN-END<=-PARMS [PARMGROUPS]

VALUE:

CARI-ORAN-END>-PARMS [PARMGROUPS]

VALUE:

CARI-ORAN-GECMIS<=-PARMS [PARMGROUPS]

VALUE: NAKDEN-KAR SABIT-DEGER-ALINDI SERMAYE-AZALTILMASI UZUN-BORC-ODENDI

CARI-ORAN-GECMIS>-PARMS [PARMGROUPS]

VALUE: BAGLI-SABIT-SATISI KISA-BORC-ODENDI SERMAYE-ARTISI UZUN-BORC-ALINDI

CARI-ORAN-PARMS [PARMGROUPS]

VALUE: ALACAK-TAHSIL-EDEBILME ALISLAR BILANCO-MEVSIM CARI-END CARI-END-GENEL
CARI-END-P CARI-GECMIS CARI-GECMIS-GENEL CARI-GECMIS-P CARIX1 CARIX10
CARIX11 CARIX12 CARIX2 CARIX3 CARIX4 CARIX5 CARIX6 CARIX7 CARIX8
CARIX9 DONER-DEGER DONER-DEGER-KIY-DEG KISA-VAD-BORC-AY KONSOLIDE
MEN-DUSUS MENKUL-DEGER-DUSUS MEVSIMLIK ROFINANS SATISLAR
STOK-DEGER-DUSUS STOK-DUSUS-M TIC-BANK-LIM TICARI-ALACAK-SENETLI
YAKIN-TARIH-ODEME

FAALIYET-KARI-END-PARMS [PARMGROUPS]

VALUE: SATILAN-MAL-BILESIMI SATILAN-MAL-MALIYETI SATIS-FIYATI-ARTISI

FAALIYET-KARI-PARMS [PARMGROUPS]

VALUE: DEGISIM FAAL-END FAAL-END-P FAAL-GEC FAAL-GEC-P FAAL-KAR FEP1 FEPX1

FRAMETYPES [PARMGROUPS]

VALUE: FAALIYET-KARI-END FAALIYET-KARI NETKAR-OZSER BRSATISKARI-NETSATIS
NETKAR-NETSATISLAR BILANCO-KAR-NET FVOK-AKTIFLER BORCLAR-AKTIFLER
KISAVADBORC-AKTIFLER MADDI-SABITLER BORMADDI-END BORCLAR-MADDIOZSER
AKTIF-DEVIR-HIZI ODHP-END OZSERMAYE-DEVIR-HIZI SDH-END< SDH-END>=
STOK-DEVIR-HIZI ALACAK-ORTALAMA-TAH ADH-END> ADH-END<=
ALACAK-DEVIR-HIZI LIKIDITE-ORAN CARI-ORAN-GECMIS<= CARI-ORAN-GECMIS>
CARI-ORAN-END<= CARI-ORAN-END> CARI-ORAN KREDI-ANALIZ-ROOT

FVOK-AKTIFLER-PARMS [PARMGROUPS]

VALUE: FVOK FVOK-END FVOK-END-P FVOK-GEC FVOK-GEC-P KAR-DAGITIMI

KISAVADBORC-AKTIFLER-PARMS [PARMGROUPS]

VALUE: KISA-END-P KISA-GEC KISA-GEC-P

KREDI-ANALIZ-ROOT-PARMS [PARMGROUPS]

VALUE: ADHP AKDHP AKTI-PUAN AKTIF-TOPLAMI BILANCOP BORCAKP BORCLAR BORCLARP

BRUTKARP COP DONER-DEGER-LIKIDITE ETKIN-TAHSILAT FAALP FIRMA-KURULUS
FIRMA-SAHIBI-ALACAGI FIRMA-SAHIBI-ALACAGI-M FIRMA-TIPI FVOKP ISTIKRAR
KAR-PUAN KISA-VAD-BORC KISABORCP KREDI-TIPI LIKI-PUAN LIKIP MADDI-OZ
MADDI-SABIT MADDISABP MALI-PUAN MUBAYA-AVANS-M MUBAYA-AVANSI NET-KAR
NET-SATISLAR NETKAROZP NETKARP ODHP REKABET SATICI-AVANS-M
SATICI-AVANSI SDH-P1 SDHP SUPHE-M SUPHELI-ALACAK TOPLAM-PUAN

LIKIDITE-ORAN-PARMS [PARMGROUPS]

VALUE: ALACAKLAR BANKALAR KASA LIKI-END LIKI-END-P LIKI-GEC LIKI-GEC-P
PESIN-GIDERLER PESIN-GIDERLER-M TAHVILLER

MADDI-SABITLER-PARMS [PARMGROUPS]

VALUE: MADSAB-END-P MADSAB-GEC MADSAB-GEC-P SABIT-DEGER-ALIYOR

NETKAR-NETSATISLAR-PARMS [PARMGROUPS]

VALUE: NET-KAR-END NET-KAR-END-P NET-KAR-GEC NET-KAR-GEC-P

NETKAR-OZSER-PARMS [PARMGROUPS]

VALUE: NETOZ-END NETOZ-END-P NETOZ-GEC NETOZ-GEC-P OZSER

ODHP-END-PARMS [PARMGROUPS]

VALUE:

OZSERMAYE-DEVIR-HIZI-PARMS [PARMGROUPS]

VALUE: ORTALAMA-OZSERMAYE OZSER-END OZSER-END-P OZSER-GEC OZSER-GEC-P OZSER1
OZSERX1

SDH-END<-PARMS [PARMGROUPS]

VALUE: EMNIYET-STOGU STOK-KALITESI STOKLARA-YATIRIM TUKE-ZEVK

SDH-END>=-PARMS [PARMGROUPS]

VALUE: STOKLAR-YENILENMESI STOKLAR-YETER

STOK-DEVIR-HIZI-PARMS [PARMGROUPS]

VALUE: ORTALAMA-STOK SATILAN-MALIN-MALIYETI SDH-END SDH-END-P SDH-GEC
SDH-GEC-P SDHX1 SDHX2 SDHX3 SDHX4