

T.C.
MARMARA ÜNİVERSİTESİ
SOSYAL BİLİMLER ENSTİTÜSÜ
İŞLETME ANABİLİM DALI
YÖNETİM VE ORGANİZASYON BİLİM DALI

MANAGEMENT OF CREDIT RISK IN THE FIRMS

Yüksek Lisans Tezi

Hasan Engin CABBAR

İstanbul, 2006

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Marmara Üniversitesi
Sosyal Bilimler Enstitüsü Müdürlüğü

Tez Onay Belgesi

İŞLETME Anabilim Dalı YÖNETİM VE ORGANİZASYON(İNG) Bilim Dalı
Yüksek Lisans öğrencisi HASAN ENGİN CABBAR ın MANAGEMENT OF CREDIT
RISK IN THE FIRMS adlı tez çalışması ,Enstitümüz Yönetim Kurulunun 22.06.2006
tarih ve 2006-06/13 sayılı kararı ile oluşturulan jüri tarafından Yüksek Lisans Tezi olarak
kabul edilmiştir.

Öğretim Üyesi Adı Soyadı

İmzası

Tez Savunma Tarihi : 30.12.2006

- 1) Tez Danışmanı : YRD. DOÇ.DR. TUBA DUMLU
2) Jüri Üyesi : DOÇ. DR. ASLI YÜKSEL MERMÖD
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LIST OF ABBREVIATIONS

CAR	: Capital At Risk
CSFB	: Credit Suisse First Boston Bank
DP	: Default Probability
EAD	: Exposure At Default
EDF	: Expected Default Frequency
EL	: Expected Loss
IRB	: Internal Rate Based
LBO	: Leveraged Buy-Out
LGD	: Loss Given Default
MDA	: Multiple Discriminant Analysis
POD	: Probability of Default
RAROC	: Risk Adjusted Return On Capital
RORAC	: Return On Risk Adjusted Capital
RRs	: Risk Rating
UL	: Unexpected Loss
VAR	: Value At Risk

INTRODUCTION

At the beginning of century, we see a low demand of credit from investors and the credit officers had a lot of knowledge about the business, past and financial situation of the borrowers. And it is easy to allocate a very long period of time for the credit evaluation. The past twenty-five years bring some changes in capital markets than were introduced in the entire prior history. Increased global trade is only one factor that has contributed to stepped-up activity in capital markets everywhere. Product diversity in financial markets themselves has exploded. In the thesis, first of all, the meaning of credit is defined and categorized according the maturity, specification and collateral structure in chapter one, with the aim to analyze credit risk issue in the next chapters.

Recently, new derivative products, which parse and price specific financial exposures, are brought to market daily. Widespread deregulation has increased competition, narrowed spreads, and lowered barriers to the flow of capital. Tremendous growth in the volume of market trade and product diversification, coupled with falling unit costs, has largely off-set the revenues lost from narrower spreads. As transaction costs are driven lower, capital moves more swiftly to the highest perceived yield-risk adjusted, of course-around the globe. The local financial institutions are now in competitions with the teams of the global financial institutions which are located in their markets. For example, if a financial institution wants to enter into the new market, establish a financial team which consists credit analysts and credit controllers then starts to marketing credit products in the market. Sovereign barriers to capital movement (particularly, the exporting of capital) are dropping as many emerging market nations compete to attract investment. The intermediaries in capital markets are feeling pressures from these changes. As a result of these changes, risk issue become more important than the past. In Chapter two, risk is defined and risk management is explained briefly with the aim to explore the benefits of risk management in the financial institutions. In Chapter three, credit risk, liquidity risk, interest rate risk, market risk, solvency risk and operational risk are analyzed.

The duration of answer to a credit demand became shorter than the past 15 years. At this point, the judgement for the creditworthiness must be objective and based some specific arguments for each transaction; this situation created the need for the rating and credit modelling which gives the opportunity to the financial institutions to react faster and with the controllable criterias.

The aim of this thesis is to create a rating system which enables to analyze the creditworthiness of the firms with objective criterias in a short time. So, in chapter four, rating system structures and methodologies are discussed.

In Chapter five and six, different types of credit risk are analyzed, the impacts of credit risk on the profitability are discussed and credit risk models are explained.

The stages to create a rating system are analyzed in the chapter seven. Industry benchmarks and financial assessment are used by the rating system created in this thesis.

In Chapter eight, importance of credit analysis and portfolio credit analysis are discussed. The financial ratios used by this rating sytem are explained in detail.

The principles of the rating sytem is based on liquidity ratios, solvency-ability to meet key term obligations ratios, leverage ratios, profitability ratios, Altman Z scores, Z prime scores and the industry averages published by TCMB. In chapter nine, Rating score cards are calculated for 14 firms which were traded, are traded in İstanbul Stock Exchange. The calculations of the rating score are compared with the historical financial situations of these firms. Two additional scenarios are discussed in order to explore the effects of the changes in the weights of the financial ratios on the rating calculation.

The results obtained of this rating system are determined in the conclusion. I think that this rating sytem should be an effective indicator to detect the financial distress of the firms before a meaningful time.

1 CREDIT

1.1. Definition of Credit

Bank loans are the primary business activity of a commercial bank. The important part of the profit of the banks is occurred by the loans. Most bank loans consists of promissory notes. A promissory note is an unconditional promise made in writing by the borrower to pay the lender a specific amount of money, usually at some specified future date. Repayment can be made(1) periodically in installements;(2) in total on a single date; or (3) in some cases, on demand. If the loan is due on demand, either the borrower or lender can end the contract at any time.

The interest rate can be fixed or floating. Generally, banks prefer floating or variable rate since the interest rate's volatility increased dramatically after 1970. Bank loans may be secured or secured. The security, or collateral, may consists of merchandise, inventory, accounts receivable, plant and equipment and in some instances, even stocks or bonds. The purpose of collateral is to reduce the financial injury to the lender if the borrower defaults. An asset's value as collateral depend on its expected resale value.

1.2. Types of Credit

Credit can be categorized according to its characteristics, duration, and collateral types.¹

1.2.1. Credits According to Their Specification

Credit is categorized as cash and non-cash credits.

Cash credits given on cash only with commission or interest.

For non-cash of credits banks provide their financial guarantee to cover a potential loss of the counter party. Banks gains commission revenues for these type of credits.

¹ Hakan Şakar, **Bankalarda Kredilendirme Teknikleri**, 2. Basım, İstanbul:Ölümsüz Öyküler Yayın ve Reklam Evi, 2002, p. 61,62,63.

1.2.2. Credits According to Their Duration

Credits can be classified into the three groups, Short-term, Mid-term, Long-Term according to their duration.

❑ Short Term Credits

Short-term credits are the credits whose duration is up to 12 months.

Self-Liquidating Inventory Loan, is a type of short term credit. It is used to finance seasonal borrowing needs of a business needing capital to acquire inventory. The borrower repays the loan as inventory is converted into cash. The creditors open these credits for the financing of raw materials or products to sell.

Working Capital Loan, is another type of short term credit. It is designed to satisfy customers' needs for temporary and seasonal funding the process of guarantee the normal production and operation activities. Working capital loan is applicable to customers with normal production and operation conditions, and existing market, profitable operation, no flawed credit records, and fairly high credit rating; secured by cheques or by pledges of inventory. Banks apply floating interest rates for these type of credits.

Retailer Financing, this type of financing used by the individuals to finance the purchase of real estate, car, holiday, education.

Asset-Based Financing, a specialized method of providing structured working capital and term loans that are secured by account receivables, inventory, machinery, equipment and/or real estate. This type of funding is great for start-up companies, refinancing existing loans, financing growth.

❑ Mid-Term Credits

Mid-term credits are the credits whose duration is between 12 months and 5 years.

❑ Long Term Credits

Long-term credits are the credits whose duration is longer than 5 years.

❑ Term Business Loans

Created to finance an investment of the equipment or the physical facilities, covering a period longer than one year. The borrowing firm applies for a lump-sum loan based on the feasibility study of its project and then pledges to repay the loan in a series of installments. Term loans

risk exposures are guaranteed by assets owned by the borrower and based either on a fixed or on a floating interest rate.

❑ Revolving Credits

A revolving credit is a line of credit where the customer pays a commitment fee and is then allowed to use funds when they are needed. It is usually used for operating purposes, fluctuating each month depending on the customers current cash flow needs.

❑ Long-Term Project Loans

These type of credits are project loans used to finance the construction of fixed assets designed to generate a flow of revenue in future periods like railways, power plants, mines, pipelines, luxury hotels.

The risks of these projects are : a) high amount of investment; b) possibility of delation of the project; c) law, legislation and political risks; d) macroeconomic factors may change as disadvantageously of the project.

A line of credit is an agreement under which a bank customer can borrow up to a predetermined limit on a short term basis(less than one year). The line of credit is a moral obligation and not a legal commitment on the part of a bank. Thus, if a company's circumstances change, a bank may cancel or change the amount of the limit at any time.

A term loan is a formal agreement under which bank will lend a customer a certain dollar amount for a period exceeding one year. The loan may be amortized over the life of the loan or paid in a lump sum at maturity.

1.2.3. Credits According To Their Collaterals

We categorize the credits according to their collaterals as non-guaranteed and guaranteed.

❑ Non-Guaranteed Credits

This type of credits is used by debtors according to their creditworthiness without taking any guarantee against the credit amount.

- Guaranteed Credits

Guaranteed credits are secured with a personal guarantee of a reputable person or a physical collateral. Real estate, cash, treasury bonds, promissory note, stock, government bonds, vehicles are examples of physical collaterals.

2 RISK MANAGEMENT

It can be divided the generation of bank revenues on two categories; first of all bank provide service to customers and take risks. By taking more risk it can expect to make more money, but greater risk also increases the danger that the banks could lose badly and be forced out of business. Banks must run their operations with two goals in mind: to generate profit and stay in business. The control of that gambling is the business of risk management. The primary function of risk management is to ensure that the total risk being taken is matched to the bank's capacity for absorbing losses in case things go wrong. A second reason for understanding risk is to help the CEO direct the scarce resource of capital to the opportunities that are expected to create the maximum return with the minimum risk. Risk management is a central function which can be thought of as both a top-down and bottom-up process. At the top level target earnings and risk limits are defined. These goals are translated into signals to business units, which line managers incorporate into customer transaction policy.² Proper risk management is essential for bank survival, and it enables management to allocate resources to various risks units based on a trade-off between risk and revenue potential.

Risk measurement attempts to answer the following four questions:

- How much could we lose?
- Can we tolerate the loss without going bankrupt?

² Andrew Kimber, **Credit Risk: From Transaction to Portfolio Management**, First Edition, Oxford: Securities Institute, 2002, p.107 .

- ❑ Is the return high enough for us to take that risk?
- ❑ How can we reduce the risk without significantly reducing the return?

In the banking universe, there are various risks which impact on profitability. Because of this reason, banks and financial institutions started to use the risk management tools. In the seventies, the competition level in the banking universe is low and the industry was heavily regulated. Commercial banking operations were basically collecting resources and lending. Limited competition made enable stable profitability. The rules limited the scope of the operations of the various credit institutions and limited their risks as well.

During the seventies and eighties, the sector faced with the inflating role of the financial markets, deregulation, and the increase in competition.

Because of the floating exchange rates, the uncertainty increased on foreign exchange markets. High levels of interest rates brings high volatility since the margin also becomes bigger.

'The disappearance of old rules created a vacancy. The regulators could no longer rely on rules that segmented the industry as barriers to risk taking behaviour. They started redefining new rules that could ensure the safety of the banking industry. Those new regulations were designed at the BIS (Bank for International settlements) and were relayed by national regulators for implementation'³

Risk determines the profitability of capital, the question is how much can we earn for each risk level. Risk managers deals with this problem, to allocate capital for the different risks in order to obtain highest return. But in this stage, we must find right solutions for the questions which are determined below:

- ❑ How risk is quantified and measured?
- ❑ How decisions will be made to hedge away unwanted risk, and optimize the management of selected risks.

³ Sergio Focardi and Caroline Jonas, **Risk Management : Framework, Methods and Practice**, Pennsylvania: Frank J. Fabozzi Associates New Hope, 1998, p. 1.

Risk will always exist since we can not know exactly what will happen in the future, it can be forecasted only.

First of all, management identifies all the uncertainties, than select appropriate methode to measure the uncertainty and finally optimize.

2.1. The Objectives Of Risk Management

Risk based capital in regulations enables the development of new techniques. Regulation concentrates on the capital adequacy principle, which means that the bank capital should match the risks.

Of course, the capital is the most expensive and scarce resource, so risk management targets risk monitoring. Banks based on the risk term, it takes risk, then it changes to the financial products.

The risk management tries to manage actively their risks, to obtain a competitive advantage against the competitors. Right pricing the risk is also another important objective, since over pricing may cause to loose the business, underpricing cause certainly to loss.

3 TYPES OF RISKS IN FINANCIAL INSTITUTIONS

The main financial risks are Interest Rate Risk, Liquidity Risk, Credit Risk and Market Risk.

3.1. Credit Risk

Credit risk is defined by the losses in the event of default of the borrower, or in the event of a deterioration of the borrower's credit quality. This simple definition hides several underlying risks. The quantity of risk is out-standing balance lent to the borrower. The "quantity" of risk is outstanding balance lent to the borrower. The " quality" of risk results both from the chances that the default occurs and from the guarantees that reduce the loss in the event of default.

The degree of risks is affected by the chances that default occurs. The amount of risk , the outstanding balance at the date of defaults is not always equal to the amount of the loss in the event of defaults because of the recoveries. The collaterals, third party guarantees, the capability of negotiating with the borrowers and the funds available change the loss amount.

Default is uncertain event, most of time, the future exposures also are not known at the time of default. In addition to this, potential recovery ratio also cannot be determined exactly in advance. Credit risks can be divided into the three categories.

- ❑ Default Risk
- ❑ Exposure Risk
- ❑ Recovery Risk

3.2. Liquidity Risk

Liquidity risk means extreme illiquidity. Bankruptcy of a big customer which generates a big part receivables, or closing of the credit lines can cause illiquidity. In this situation, short term asset values are not enough to cover short term liabilities or unexpected outflows.

If a firm's liquidity is high, it helps to the management to gain time in the financial crisis. For the financial institutions liquidity risk is a normal result of transactions since the probability of occurring a maturity gap between assets and liabilities is always existing. They collect short term resources and lend these resources in the long term.

3.3. Interest Rate Risk

In the money market, the interest rate fluctuates continuously, interest rate risk can be defined as the decline of the earnings because of the movements of interest rate contrary to the position of financial institution. The interest rate risk is the risk of declines of earnings due to the movements of interest rates which are unstable, so are earnings. There are various indexations on market rates. In some cases, the rate of outstanding loans is directly related to some market rate. But any transaction reaching maturity is also indexed on market conditions if it is renewed, even if its rate is fixed. Fixed rates become variable at maturity. Those rates which are variable are fixed between two revisions date. Also the period between two revisions is not necessarily constant.

Another source of interest rate risk is that the borrower can always repay the loan and borrow at a new rate, a right that he will exercise when interest rates decline substantially.

3.4. Market Risk

Risk which is common to an entire class of assets or liabilities. The value of investments may decline over a given time period simply because of economic changes or other events that impact large portions of the market.

Market risk exists for any period of time. Earnings for the market portfolio are profits and losses (P&L) arising from transactions. Any decline in value will therefore result in a market loss for the corresponding period equal to the difference between the beginning and the ending mark-to-market values.

Obviously, there is a large range of possible variations of values between any two dates, since the magnitude of market moves is random. In order to define the potential adverse deviation, rules are required to identify what could be a "maximum" deviation.

3.5. Solvency Risk

Solvency risk is the risk that a creditor will lose his entire investment if a debtor cannot repay him in full. Solvency is the end result of available capital and of all risks taken: credit, interest rate, liquidity market or operational risks. The solvency risk is critical for regulators. The fundamental issue of capital adequacy is to define what level of capital should be associated with the overall risk in order to sustain an acceptable solvency level. The principle of capital adequacy follows and sets up the major orientations of risk management. These can be summarized by the following principles:

- ❑ All risks generate potential losses.
- ❑ The ultimate protection for such losses is capital.
- ❑ Capital should be adjusted to the level required to make it capable of absorbing potential losses generated by all risks.
- ❑ The implementation of this principle requires that:
 - ❑ All risks should be quantified in terms of potential losses.

A measure of aggregated potential losses should be derived from the measurement of potential losses generated by different risks. Today such measures are well known under the names of VAR(Value at Risk) or CAR(Capital at Risk) Both measure potential losses.

3.6. Operational Risk

Operational risk is the risk of loss resulting from inadequate or failed internal processes, people and systems or from external events. Operational risks appear at two different levels: Firstly, the technical level, when the information system, or the risk measures, are deficient; Secondly, the organizational level, reporting and monitoring of risks, and all related rules and policies.

Regulators are also concerned with questions related to the overall macroeconomic effect of risk management. How will firm-wide risk management affect the global risk and volatility present in the markets? Is there any way to protect against large-scale market swellings? What are the ultimate risks present in the economy?

There is the perception that regulators understand the basic process of value generation and the process of risk management at the firm level. But at different levels of aggregation, namely at the global macroeconomic level, financial risk is still poorly understood. There is no widespread agreement on the effectiveness of measures to protect the system; nor is there a sound understanding of just what the risks are.

As for financial firms, the objectives of risk management vary from one organization to another and from one function or level to another inside the same organization. Broadly speaking, financial firms have four objectives in risk management:

- ❑ Comply with the regulators,
- ❑ Obtain a good rating, at the product and/or firmwide level,
- ❑ Protect the business against unfavorable events,
- ❑ Optimize the risk-return trade-off.

4 CREDIT RISK MANAGEMENT

Credit risk management covers the decision making process, before the credit decision is made, and the follow-up of credit commitments. Monitoring and reporting processes also included in credit risk management.

The decision-making process covers the steps, starting with a credit application form, examination of the credit application and all reviews of the proposal. Decision-making process should be centralized or decentralized? Most of credit experts tell that a centralized credit structure is the only way to go. The two most common reasons are cost and control. It is much less expensive to have a centralized operation.⁴

Classical approach is to decide according to the financial datas and judgemental assessment of the market outlook, of the borrower, of the management. The sector analysis made by analysts is also important factor in the decision making process.

Bluhm, Overbeck, Wagner stated as;

'Why is credit risk management an important issue in banking? Assume, a major building company is asking its house bank for a loan in the size of 100 million Euro. Somewhere in the bank's credit department a senior analyst has the difficult job to decide if the loan will be given to the customer or if the credit request will be rejected. Let us further assume that the analyst knows that the bank's chief credit officer has known the chief executive officer of the building company for many years, and to make things even worse, the credit analyst knows from recent default studies that the building industry is under hard pressure and that the bank internal rating of this particular building company is just on the way down to a low subinvestment grade. What should the analyst do? Well, the most natural answer would be that the analyst should reject the deal based on the information she or he has about the company and the current market situation. An alternative would be to grant the loan to the customer but to insure the loss potentially arising from the engagement by means of some credit risk management instrument.(so called credit derivative)'⁵

⁴ William Atkinson, "Credit Central or Not?", **Collections & Credit Risk**, 10, Oct 2005, p.3.

⁵ Bluhm Christian, Overbeck Ludger, Wagner Christoph, **An Introduction To Credit Risk Modelling**, London: Chapman & Hall/CRC, 2003, p.15.

The follow-up is done through periodic reporting reviews of the bank commitments by customer, industry and country. In addition, "warning systems" signal the deterioration of the situation of the borrower before default whenever possible. A work-out process, by which all actions to reduce possible losses are reviewed and taken can be triggered if a default occurs.

The financial institutions prefer to limit credit risk by constraints in order to limit the losses at the time of default. The authorization sets maximum risk amount for any customer, or group firms.

Credit proposals are approved within these limits if the customer meet the standart of the bank. To use the limit system efficiently, the risk reporting system should enable the risk management to monitor all the credit risk related with a unique customer or group of customers.

By setting limits banks should diversify the committments between different aspects such as customers, industry, regions, country, the important issue is to avoid lending a borrower an amount beyond its borrowing capacity. Debt/Equity ratio is used to determine the borrowing capacity of the borrower.

Limit systems are widely spread. Sometimes they are not relevant as they appear. When the bank is dealing with a limited number of big customers, it is difficult to set limits. First lending is based on a continous relationship. Setting limits and relationship financing are interacting processes. Second big corporations with an excellent credit standing are less subject to limits given the high quality of their risk.

The limit systems centralize the information about borrowers, both authorizations and usages of credit lines. In addition to limiting the amount at risk, the centralization is also a basis for defining portfolio orientations, such as increasing the diversification, or reducing a concentration in a given industry, or any other guidelines.

4.1. Risk Quality and Rating Systems

Risk management should relate the amount of risk with the information of risk quality which contains the default probability, and the recoveries in the event of default. Rating system provides the necessary information about risk quality.

The rating agencies, such as Standard and Poors, Moodys, Duffe & Bread developes rating systems for the internal use and rating also the companies with their own request or request of the creditors.

Ratings qualify the risk of losses in the event of default, a combination of default probabilities and recoveries. A rating system requires some effort to be relevant. For corporate borrowers, the criteria for assessing risk are well known: profitability, growthy, industry outlook, competitive advantages, management and shareholders, in addition to the standard set of ratios.

4.2. Credit Enhancement

Credit enhancement aims to reduce the amount of loss in the event of default. The the tird party guarantees and collaterals enables us to reduce the amount of loss in the event of default. Letter of credit, complex structures for LBO (Leverage Buy-Out) , securitization, asset acquisition are the main vehicles of credit enhancement.

The decion-making process based on the values of collaterals, but the value of these collaterals are ucertain and especially real estates values shows high volatility during crisis. For example Japan bank system damaged hardly because of the real asset credits, since Japan banks gave credit for the purchase of real estates during the growth period of the economy by setting mortgage as collateral for these credits, when the economic crisis caused dramatic decrease in the prices of real assets so the collateral couldn't increase the recovery of the non performing loans.

The actual goal of covenants is to initiate negotiations with the borrower before default, not to trigger default. There are financial covenants based on the usual financial ratios. For instance, the debt/equity ratio can be constrained to remain below a stated limit.

The credit enhancement is obtained by the separation, partial or almost total, of the risk of the transaction from the risk of the borrower. Credit enhancing vehicles achieve this purpose by risk transformation as well as risk reduction. The collateral changes the credit risk into a recovery risk plus an asset value risk.

The importance of credit- risk management has never been more important with the current high default rates and bankruptcies; but there was heightened interest even before

the current scenario. Indeed, in 1999, at the end of the benign credit cycle, banks, regulators, and financial market practitioners were spending considerable time on this subject due to:

- ❑ Increased emphasis on sophisticated risk management techniques in a changing regulatory environment- mainly revisions to the so-called 'Basel Accord'
- ❑ Refinements in credit-scoring techniques
- ❑ Establishments of relatively large, relevant data bases on defaults, recoveries and credit migrations
- ❑ Treatment of bank loans as securities
- ❑ Development of 'offensive' credit-risk mitigation techniques such as securitizations, credit derivatives and credit insurance products
- ❑ Portfolio management techniques for credit assets.

Lending institutions are increasingly comfortable with transacting their assets in counterparty arrangements where-by credit-risk exposure is shifted.

This motivation has helped to stimulate the congruence of several important ingredients for the sophisticated treatment of corporate credit evaluation and management, including stand-alone valuation techniques, structured credit asset products, portfolio-management approaches, comprehensive and reliable relevant databases, and the growth in credit-derivative and other types of credit-insurance and hedging structures.

In addition to these evolutionary developments, at the start of this new century there are powerful stimuli coming from record levels of defaults and defaults losses in the USA in the corporate bond and leveraged loan markets and the imminent changes in bank capital allocation for credit assets promoted by the new Basel (BIS) guidelines, scheduled to be ratified in late 2002 and implemented by 2005. Indeed, recent BIS reports (1999, 2000 and 2001a,b) have dazzled the credit world.

On managing credit assets to new levels of sophistication, specificity and interest. Several books and articles, have been written to comment on these developments and we can expect many more in the coming years.

The US economy had been strong for more than seven years, 1992-1999, and most of the world's stock markets were booming for a substantial amount of time during this period, reflecting high corporate profits and growth and relatively low interest rates. As a result, credit markets in most of the world, with some conspicuous exceptions (Mexico and Latin America in 1995, Southeast Asia in 1997 and Japan for almost a decade) enjoyed the so-called 'benign credit cycle', whereby credit products and the size of credit assets grew dramatically. Non-performing loans and high-yield bond default rates were under 2 per cent per year and default losses were under 1 per cent respectively in every year for the 1994-98 period. High-yield bond new issuance in the USA exceeded \$100 billion for many years and leveraged loans (with yield spreads of at least 150 b.p. over risk-free Treasuries) averaged over \$200 billion per year. What's more Europe 'discovered' credit assets as the euro was being introduced and governments were mandated to reduce their deficits and their dependency for growth on government securities. This gave birth to the euro high-yield bond market and other credit risky financing structures as the old millennium was ending.

4.3. BIS Story (Bank for International Settlements)

For more than a decade, the so-called Basel I Accord of 1988 set the standard for bank capital allocation worldwide. It was clear that these standards, set before we had comprehensive data for assessing credit risk across the entire credit rating spectrum, was sadly antiquated, for example, the 8 per cent capital rule on corporate credit assets regardless of the risk rating of the asset. Then, in June 1999, the BIS "New Capital Adequacy Report" (1999) shocked the markets with its three-pillar approach and the precise recommendation for change in capital allocated across the credit assessment spectrum. Equally important was its recognition of external, and possibly internal, rating systems to determine risk weights and capital benchmarks. After an active commentary period, the BIS again surprised many observers with an even finer breakdown of capital standards across the spectrum of credit risk and a more precise recognition of internal rate based systems (IRB) for setting default (P_D) probabilities (Foundation Approach) and loss given default (LGD) parameters (Advanced Approach). Although the BIS did not go as far as to authorize

the application of sophisticated portfolio credit risk models. This has motivated the development or enhancement of internal credit rating systems and other credit-risk capital considerations, such as operation risk, and their impact on economic capital and the pricing of credit assets. The importance of portfolio diversification has been introduced in the new capital standards by specifying a certain degree of correlation of default risk across credit assets (e.g. 0.20 or 0.10 depending on the rating quality of the results)

The lending institutions primarily commercial banks , have reached a certain maturation stage whereby they no longer make loans, or purchase securities, and hold them either to maturity or to charge-off. Moreover, if the loans/bonds default , par investors like banks and non-bank institutions are no longer content to wait-out the restructuring process. They may very value the securities in default and decide to sell them to distressed debt investors in the secondary, so-called 'vulture' investment markets. Stimulated by pressures from regulators, creative securities firms, dynamic trading markets and internal return on equity objectives, banks are increasingly willing to consider transacting their assets in counterparty arrangements whereby the credit-risk exposure is shifted with the reduction in total risk of the original lender. Because the markets in which credit assets are hedged or sold are quite young, still fairly illiquid and probably inefficient, banks and their counterparties are struggling to amass the information and analytical foundation for valuing the underlying assets in some form of meaningful risk-return framework.

This motivation has helped to stimulate the congruent coming of age of four important ingredients for the sophisticated treatment of corporate credit evaluation and management:

- ❑ Stand-alone valuation techniques
- ❑ Comprehensive and relevant databases
- ❑ Attempts to resolve the portfolio credit-risk problem
- ❑ The advent and impressive growth in the structuring and trading of credit-risk derivatives and various types of credit insurance and guarantees

The assertion that market practitioners in the late 1990s and now at the end of 2001, are placing strong emphasis on credit-risk management does not imply that interest was nonexistent or even low in the past. Indeed, this matter received significant attention throughout most of the world with the structural increase in defaults in the late 1980s and early 1990s. The USA “led” the way with record bank loan and public corporate bond defaults caused by many illfated, highly leveraged restructurings of the mid-and late-1980s, an economic recession and the inability of marginal firms to refinance their obligations.

The junk bond default rate jumped to more than 10 per cent in 1990 and 1991 and many sceptics argued that high –credit –risk markets, such as leveraged bank lending and junk bond financing, were likely to disappear. This surmise proved to be far from the reality, as new issuance in both of these lending markets reached record levels in the period 1996-98.

Although these events, prior to 1997, heightened concern about established credit-management techniques and the lack of a meaningful credit culture within the world’s largest and most sophisticated financial institutions, we did not as yet witness a pervasive interest in the creation and evaluation of new valuation techniques. What we observed was the occasional stand-alone valuation model, continued refinement of some relevant default databases (first established in the mid-1980s), and surveys by regulators and consultants of existing techniques. The surveys invariably reached the conclusion that credit cultures of financial institutions and their lending strategies needed to be rethought and possibly redesigned; see, for example, Wuffli and Hunt (1993)⁶

These calls for reassessment came at a time of increased competition in lending markets as more varied types of firms were intermediating credit.

Corporations no longer needed to negotiate with different types of institutions for their complex borrowing needs. Banks were underwriting credits of all maturities, and securities firms were making loans, as well as underwriting bonds. The concept of a ‘one-stop financial conglomerate’ arrived and, with it, the reduction of profit margins on traditional lending as the markets became more competitive. In order to regulate the credit market, “Principles for the management of Credit Risk are set out in the consultative paper issued by the Basel Committee on Banking Supervision.(2000)”

⁶ P.Wuffli,D.Hunt, “Fixing the Credit Problem”,**McKinsey Quarterly**, 2, 1993, p.93,94.

☑ Establishing an Appropriate Credit Risk Environment

The board of directors should have the responsibility for approving and periodically reviewing the credit risk strategy and significant credit risk policies of the bank. The strategy should reflect the bank's tolerance for risk and the level of the profitability the bank expects to achieve for incurring various credit risks.

Senior management should have the responsibility for implementing the credit risk strategy approved by the board of directors and for developing policies and procedures for identifying, measuring, monitoring, and controlling credit risk. Such policies and procedures should address credit risk in all of the bank's activities and at both the individual credit and portfolio levels.

Banks should identify and manage credit risk inherent in all products and activities. Banks should ensure that the risks of products and activities new to them are subject to adequate procedures and controls before being introduced or undertaken, and approved in advance by the board of directors.

☑ Operating under a Sound Credit-Granting Process

Banks must operate under sound, well defined credit-granting criteria. These criteria should include a thorough understanding of the borrower or counterparty, as well as the purpose and structure of the credit and its source of repayment.

Banks should establish overall credit limits at the level of individual borrowers and counterparties, and groups of connected counterparties that aggregate in a comparable and meaningful manner different types of exposures, both in the banking and trading book and on and off the balance sheet.

Banks should have a clearly established process in place for approving new credits as well as the extension of existing credits.

All extensions of credit must be made on an arm's-length basis. In particular, credits to related companies and individuals must be monitored with particular care and other appropriate steps taken to control or mitigate the risks of connected lending.

☑ Maintaining an Appropriate Credit Administration, measurement and Monitoring Process

Banks should have in place a system for the ongoing administration of their various credit risk-bearing portfolios.

Banks must have in place a system for the monitoring the condition of individual credits, including determining the adequacy of provisions and reserves

Banks should develop and utilize internal risk rating systems in managing credit risk. The rating system should be consistent with the nature, size, and complexity of a bank's activities.

Banks must have information systems and analytical techniques that enable management to measure the credit risk inherent in all on-and off-balance sheet activities. The management information system should provide adequate information on the composition of the credit portfolio, including identification of any concentrations of risk.

Banks must have in place a system for monitoring the overall composition and quality of credit portfolio.

Banks should take into consideration potential future changes in economic conditions when assessing individual credits and their credit portfolios, and should assess their credit risk exposures under stressful conditions.

☒ **Ensuring Adequate Controls over Credit Risk**

Banks should establish a system of independent, ongoing credit review and the results of such reviews should be communicated directly to the board of directors and senior management. Banks must ensure that credit-granting function is being properly managed and that credit exposures are within levels consistent with prudential standards and internal limits. Banks should establish and enforce internal controls and other practices to ensure that exceptions to policies, procedures, and limits are reported in a timely manner to the appropriate level of management.

☒ **The Role of Supervisors**

Supervisors should require that banks have an effective system in place to identify, measure, monitor and control credit risk as part of an overall approach to risk management. Supervisors should conduct an independent evaluation of a bank's strategies, policies, practices, and procedures related to the granting of credit and the ongoing management of the portfolio⁷

⁷ Edward I. Altman , "Managing Credit Risk: A Challenge For The New Millennium" **Economic Notes by Banca Monte dei Paschi di Siena Spa** vol 31, No:2-2002, p.201,214.

5 CREDIT RISK

There are two definitions of credit risk for the traders, credit risk is the spread above a risk free yield curve. For the traditional bank loan officers, credit risk is the risk of loss caused by the default of the counterparty, failure of counterparts perform the contract conditions. In the crisis, credit markets will be the first to boom, and the holders of credit risk can not easily to liquid their assets, generally they are forced to preserve in their portfolio.

Default's probability is very low, but the consequence of default means very large loss for the banks.

Traders measure credit risk as the spread above a risk-free yield curve. It is the premium that the market demands for holding instruments that may default. Traders are concerned with whether the spread or credit risk premium will widen, lowering the value of the debt they hold. They assume that there is a liquid market for credit risk; in fixed-income markets, where these traders deal, that assumption is largely true.

On the other hand, traditional bank loan officers view credit risk as the risk of loss due to failure of a counterparty to perform as contracted. It is the loss that will occur when a loan defaults or a trading counterparty fails to settle. Loan officers are concerned with how the bank will get repaid. They assume loans are bought and held to maturity. Holders of this view (in the world of commercial loans, it is the prevailing position) are less concerned about the market value of a loan. However, market forces and the market perspective are encroaching.

Eventually, a hybrid perspective will evolve, based on how liquid the loan markets eventually become. However, default events will continue to create precipitous changes in value, no matter how liquid the markets are. Also liquidity in credit markets will always be tenuous. In times of stress, credit markets will be the first to freeze, and holders of the risk may be forced to retain it until it matures or defaults.⁸

Several other characteristics of credit risk make it difficult to measure. Default is a low probability event, but with big consequences very large losses. With the probability of default being so small (sometimes fractions of percent), very small shifts can lead to a big

⁸ James T. Gleason, **The New management Imperative In Finance RISK**, Bloomberg Press, 2000, p.28,29,30.

exposure, default and recovery, but features within the two markets force them to do it very differently.

Credit risk from traditional lending is pretty straightforward. The institution has loaned money (or is committed to loan money) and is concerned with how the loan will be repaid. The exposure of the loan amount is fairly static, so the concern is primarily over default probability, with a secondary concern about recovery. Lenders focus on what might cause the borrower to default, and how much of the loan they can recover in default. The loans are typically extended to corporate customers and frequently contain clauses related to issues of seniority or collateral that help ensure significant recovery. Similarly, contingent credit risk, like letters of credit and guaranties, result in a known loss if a default or series of default occurs.

J.B. Caouette, E. I. Altman, P. Narayanan stated:

“For the last five years (1994 through 1998), well under 2 percent of total bank loans have been nonperforming, compared to an average of close to 4 percent in 1988 through 1993. Default rate on leveraged loans and junk bonds were likewise well under 2 percent for the last three years, in contrast to the 3.6 % average for junk bonds in 1971 through 1996. Given these positive credit market statistics, the current surge of interest in new techniques for managing credit risk is surprising. Why is it happening?⁹

The answer, we believe, may be found in the changes that have occurred in both the lending institutions and the markets in which they operate. Lending institutions have reached a stage of development where they no longer want or need to make (buy) a loan and hold it to the end of its natural life (maturity, pay off, or charge off). The reasons undoubtedly include pressures from regulators, the emergence of dynamic trading markets for loans, and the pursuit of internal objectives for return on equity.”

Credit risk arises in many forms. The most obvious form is default on a loan, failure to repay an amount that has been lent. The same risk occurs when the issuer of a bond fails to make the payments promised by the bond. More subtle forms of credit risk arise in trading operations. Counterparty risk refers to the possibility that a trading counterparty will fail to

⁹ J.B. Caouette, Edward I. Altman, Paul Narayanan, **Managing Credit Risk The Next Great Financial Challenge**, New York: John Wiley & Sons Inc, 2003, p.114,115.

pay if it loses money on a deal. Settlement risk occurs if a bank fails to settle its side of a trade; this is also known as Herstatt risk, after the famous default described below.¹⁰

Loan Credit Risk

In January of 1999, Guangdong International Trust and Investment Corporation defaulted on the repayment of \$4.5 billion, half of which was owed to overseas banks. In August of 1999, Iridium, the satellite telecommunications company, defaulted on two syndicated loans of \$1.5 billion that it had borrowed to launch the satellites but could not repay due to unexpectedly low earnings.

Issuer Credit Risk

On August 17, 1988, Russia unilaterally rescheduled repayments on \$43 billion of bonds that had been sold to western banks and investors. The investors eventually recovered only a fraction of the \$43 billion. In February of 2001, PG&E, a Californian electric utility, defaulted on \$726 million of short-term bonds that it had issued. However, its default was selective, and it continued to pay interest on \$8 billion of other debt.

Counterparty Credit Risk

In 1998, the Moscow Interbank Currency Exchange and several Russian banks defaulted on currency derivatives with Credit Suisse First Boston (CSFB). The exchange rate had moved such that the banks owed \$600 million to CSFB.

Settlement Credit Risk

In 1974, a small German bank, Bankhaus Herstatt had a string of losses in foreign exchange dealings. It went bankrupt at the end of a trading day in Germany. Because it was the end of the trading day in Germany, it had already received \$620 million worth of FX payments from its U.S. trading counterparties; but because the U.S. markets were still open, Herstatt had not yet been required to deliver \$620 million for its side of the trades. At the time that it went bankrupt, it stopped all payments, and the U.S. banks lost virtually all of the \$620 million.¹¹

In recent years, the way of measuring and managing credit risk is changed, the financial engineering professionals applied their model-building skills and analysis to this area. The main causes of this change in credit risk management are stated below.

¹⁰Christine A. Brown, Sally Wang "Credit Risk The Case of First Interstate Bankcorp", **International Review Of Financial Analysis**, Vol.11 (November,2002),p.229,230.

¹¹ Chris Marrison, **The Fundamentals Of Risk Measurement**, Boston: McGraw-Hill, 2002, p.6.

Structural Increase In Bankruptcies, although the most recession hit at different times in different countries, most bankruptcy statistics showed a significant increase in bankruptcies, compared to the prior recession. To the extent that there has been a permanent or structural increase in bankruptcies worldwide due to the increase in global competition, accurate credit risk analysis becomes even more important today than in the past.

Disintermediation, as capital markets have expanded and become accessible to small and middle market firms (20,000 U.S. companies have actual or potential access to the U.S. commercial paper market. The firms or borrowers “left behind” to raise funds from banks and other traditional financial institutions are increasingly likely to be smaller and have weaker credit ratings.

More Competitive Margins, almost paradoxically, despite a decline in the average quality of loans (due to the second reason above), interest margins or spreads, especially in wholesale loan markets, have become very thin—that is, the risk-return trade-off from lending has gotten worse. A number of reasons can be cited, but an important factor has been the enhanced competition for lower quality borrowers, such as from finance companies, much of whose lending activity has been concentrated at the higher risk-lower quality end of the market.

Declining and Volatile Values Of Collateral, concurrent with the recent Asian crisis, banking crises in well-developed countries such as Switzerland and Japan have shown that property values and real asset values are very hard to predict and to realize through liquidation. The weaker and more uncertain collateral values are, the more risky lending is likely to be. Indeed, current concerns about “deflation” worldwide have accentuated concerns about the value of real assets such as property and other physical assets.¹²

¹² Christine A. Brown, Sally Wang, 2002, p. 230.

We can divide CREDIT RISK into three parts:

- ❑ Default Risk,
- ❑ Exposure Risk,
- ❑ and Recovery Risk.

5.1. Default Risk

Default risk is the probability of the event of default. There are several definitions of "Default": missing a payment obligation, breaking a covenant, entering a legal procedure, or economic default. Payment default is declared when scheduled payment has not been made for a minimum period, such as three months, after the due date. Breaking a covenant, such as a financial ratio subject to upper or lower bounds, is a technical default. The default can also be purely economic without being associated with any specific event. An economic default occurs when the economic value of assets goes below the value of outstanding debts. The economic value of assets is the value of future expected cash flows discounted to present. Such value constantly changes with market conditions. If the market value of assets drops below that of liabilities, it means that the current expectations of future cash flows are such that the debt cannot be repaid.

The definition of default is important in estimating the chances of default, for instance from historical records. Rating agencies consider that default occurs when a contractual payment has been missed for at least three months.¹³

5.2. Default Probability

Default risk is measured by the probability that default occurs during a given period of time. Default probability cannot be measured directly. Historical statistics of defaults can be used.¹⁴ Such data can be collected internally or obtained from rating agencies or from central

¹³ David S. Kidwell, Richard L. Peterson, **Financial Institutions , Markets, and Money**, Orlando: Dryden Press, 1990, p.81,82.

¹⁴ Arnaud de Servigny, Olivier Renault, **Measuring and Managing Credit Risk**, Standard & Poors, 2003 p.124,125.

authorities. From statistics of observed defaults, the ratio of defaults in a given period over the total sample of borrowers can be derived. It is a default rate, which often serves as an historical proxy for default probability. Such ratios or default frequencies are available by industry or by rating class. There are several types of ratings: debt issue ratings, issue ratings, issuer ratings and industry ratings. In most cases, agencies rate the quality of risk of a debt issue. The quality of risk is defined as the severity of losses which depends upon both default probability and recoveries in the event of default.

The data available from rating agencies provide relevant information from a statistical standpoint. They include, for each rating class:

- ❑ The frequencies of defaults, yearly or for longer periods of time
- ❑ The volatility across time of yearly frequencies, which results from the changes of general economic conditions
- ❑ The transition matrices between rating classes. These give the percentage issues in which rating X changed into rating Y during a certain period.

Default rates are unstable with the passing of time. The volatility of yearly historical default rates is the standard deviation of observed values. The volatility increases with the level of default rate, that is when the rating diminishes. The low default rates are closer to the zero value line which limits their variations.

If the volatility is high, the potential deviations of the default rate around the average can be significant. If the volatility is low, deviations are small. The unexpected loss will be higher in the first case. The default rate volatility is a simple base for measuring the unexpected loss for loan portfolios. The unexpected loss is proportional to this standard deviation. The expected loss is proportional to the average default rate.

"The task of assigning a default probability to every customer in the bank's credit portfolio is far from being easy. There are essentially two approaches to default probabilities:

- ☑ Calibration of default probabilities from market data.

The most famous representative of this type of default probabilities is the concept of Expected Default Frequencies(EDF) from KMV Corporation^(*). Another method for calibrating default probabilities from market data is based on credit spreads of traded products bearing credit risk, e.g., corporate bonds and credit derivatives (for example credit default swaps)

- ☑ Calibration of default probabilities from ratings.

In this approach, default probabilities are associated with ratings, and ratings are assigned to customers either by external rating agencies like Moody's Investors Services, Standard & Poor's (S&P), or Fitch, or by bank-internal rating methodologies.¹⁵

Calibration of Default Probabilities to Ratings

The process of assigning a default probability to a rating is called a calibration. The end product of a calibration of default probabilities to ratings is a mapping

Rating $\rightarrow$ DP, e.g., (AAA,AA,.....C) $\rightarrow$ (0,1), $R \rightarrow DP(R)$,

Such that to every rating R a certain default probability DP(R) is assigned.

From Moody's website or from other resources it is easy to get access to their recent study of historic defaults. There one can find a table like the one shown in Table 1.2 showing historic default frequencies for the years 1983 up to 2000.

An important observation is that for best ratings no defaults at all have been observed. This is not as surprising as it looks at first sight: For example rating class Aaa is often calibrated with a default probability of 2 bps ("bp" stands for 'basispoint' and means 0.01%), essentially meaning that one expects a Aaa – default in average twice in

^(*) KMV Corp., founded 13 years ago, headquartered in San Francisco, develops and distributes credit risk management products.

¹⁵ Bluhm, Overbeck, Wagner, 2003

10,000 years. This is a long time to go; so, one should not be surprised that quite often best ratings are lack of any default history. Nevertheless we believe that it would not be correct to take the historical zero-balance as an indication that these rating classes are risk-free opportunities for the credit investment. Therefore, we have to find a way to assign small but positive default probabilities to those ratings.

1. Denote by $h_i(R)$ the historic default frequency of rating class R for year i , where i ranges from 1983 to 2000. For example $h_{1993}(Ba1) = 0.81\%$. Then compute the mean value and the standard deviation of these frequencies over the years, where the rating is fixed, namely

$$m(R) = \frac{1}{2000 - 1983 + 1} \sum_{i=1983}^{2000} h_i(R) \text{ and}$$

The mean value $m(R)$ for rating R is our first guess of the potential default probability assigned to rating R . The standard deviation $s(R)$ gives us some insight about the volatility and therefore about the error we eventually make when believing that $m(R)$ is a good estimate of the default probability of R -rated obligors. Because even best rated obligors are not free of default risk, we write "not observed" in the cells corresponding to $m(R)$ and $s(R)$ for ratings $R = Aaa, Aa1, Aa2, A1, A2, A3$ (ratings where no defaults have been observed)

2. Next, we plot the mean values $m(R)$ into a coordinate system, where the x-axis refers to the rating classes (here numbered from 1 (Aaa) to 16 (B3)). In the figure 1.1, we can see that on a logarithmic scale the mean default frequencies $m(R)$ can be fitted by a regression line. Here we should add a comment that there is strong evidence from various empirical default studies that default frequencies grow exponentially creditworthiness. For this reason we have chosen an exponential fit (linear on logarithmic scale). Using standard regression theory, one can easily obtain the following exponential function fitting our data:

$$DP(x) = 3 \times 10^{-5} e^{0.5075 x} \quad (x = 1, \dots, 16).$$

3. As a last step, we use our regression equation for the estimation of default probabilities $DP(X)$ assigned to rating classes x ranging from 1 to 16. Fig 1.1 shows our result, which we now call a calibration of default probabilities to Moody's ratings. Note that based on our regression even the best rating Aaa has a small but positive default probability. Moreover, our hope is that our regression analysis has smoothed out sampling errors from the historically observed data."¹⁶

5.3. Exposure Risk

Exposure risk is generated by the uncertainty prevailing with future amounts at risk. Amortizing credit is repaid within a contractual schedule, so that future outstanding balances are known in advance, except in case of repayment schedule, the exposure risk can be considered as small or negligible.

Committed lines of credit allow the borrower to draw on those lines whenever he wants to, depending upon his needs, and subject to a limit fixed by the bank. Overdraft balances, for instance, change at the initiative of the clients. Project financing implies uncertainty in the scheduling of the outflows and repayments. In general, all off-balance sheet items can generate future exposures. In some cases, those future exposures are highly likely, such as when the bank is committed to lending money up to some maximum amount, subject to the needs of the borrower. In other cases, future exposures are unlikely to appear, for instance for such given contingencies as guarantees given to third parties. In these cases, the third party calls the guarantee if, and only if, the borrower fails to comply with some obligation. The exposure is contingent upon client initiative or some specific event. Other exposure risks arise with derivatives. In this case, the source of uncertainty is not the client's behaviour but lies in market movements.

Therefore it is natural to define the EAD by

$$EAD = OUTST + \gamma \times COMM,$$

¹⁶ Bluhm, Overbeck, Wagner, 2003, p.113.

Peter O. Davis stated:

“Where OUTST denotes the outstandings and COMM the commitments of the loan, and γ is the expected portion of the commitments likely to be drawn prior to default. More precisely, γ is the expectation of the random variable capturing the uncertain part of the EAD, namely the utilization of the undrawn part of the commitments. Obviously, γ takes place in the unit interval. Recall that we assume the EAD (Exposure At Default) to be a deterministic quantity. This is the reason why we directly deal with the expectation γ , hereby ignoring the underlying random variable.

The Basel Committee on banking Supervision in its recent consultative document defines EAD for on-balance sheet transactions to be identical to the nominal amount of the exposure. For off-balance sheet transactions there are two approaches: For the foundation approach the committee proposes to define the EAD on commitments and revolving credits as 75% of the off-balance sheet amount of the exposure. For example, for a committed line of one billion Euro with current outstandings of 600 million, the EAD would be equal to $600 + 75\% \times 400 = 900$ million Euro.

The Loss Given Default, the LGD of a transaction is more or less determined by “1 minus recovery rate”, i.e., the LGD quantifies the portion of loss the bank will really suffer in case of default. It measures the risk that a loss will be incurred given that there has been a default even. The inverse of this concept is the recovery rate. It is expressed as a percent of the outstanding balance at default. The estimation of such loss quotes is far from being straightforward, because recovery rates depend on many driving factors, for example on the quality of collateral (securities, mortgages, guarantees, etc.) and on the seniority of the bank's claim on the borrower's assets.¹⁷ A bank-external source for recovery data comes from the rating agencies. For example Moody's provides recovery values of defaulted bonds, hereby distinguishing between different seniorities. Unfortunately many banks do not have good internal data for estimating recovery rates. However, one can expect that in a few years LGD databases will have significantly improved, such that more accurate estimates of the LGD for certain banking products can be made. *Unexpected loss*, expected loss of a transaction is an insurance or loss reserve in order to cover losses the bank expects from historical default experience. But holding capital as a cushion against expected losses is not enough. In fact, the bank should in addition to the expected loss reserve also save money for covering unexpected losses exceeding the average experienced losses from past history.

¹⁷ Peter O. Davis, “Credit Risk Measurement: Avoiding Unintended Results”, **The RMA Journal**, (April, 2004) p. 86.

Rating	Mean	Standard-Deviation	Default Probability
Aaa	not observed	not observed	0.005%
Aa1	not observed	not observed	0.008%
Aa2	not observed	not observed	0.014%
Aa3	0.08%	0.33%	0.023%
A1	not observed	not observed	0.038%
A2	not observed	not observed	0.063%
A3	not observed	not observed	0.105%
Baa1	0.06%	0.19%	0.174%
Baa2	0.06%	0.20%	0.289%
Baa3	0.46%	1.16%	0.480%
Ba1	0.69%	1.03%	0.797%
Ba2	0.63%	0.86%	1.324%
Ba3	2.39%	2.35%	2.200%
B1	3.79%	2.49%	3.654%
B2	7.96%	6.08%	6.070%
B3	12.89%	8.14%	10.083%

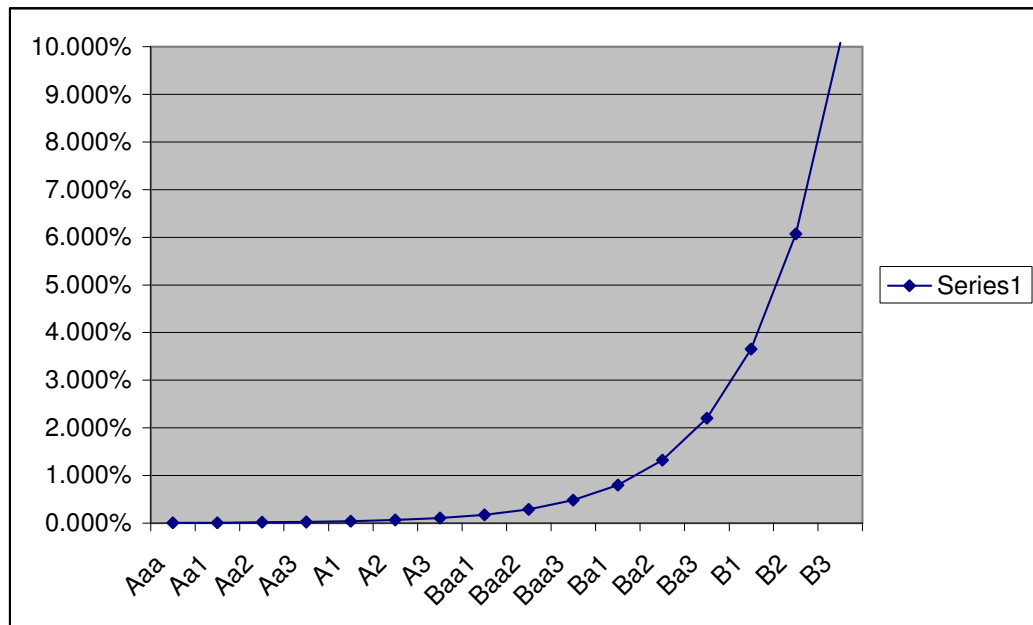


Table 1 Moody's Ratings to Default Probabilities

Figure 1 Calibration of Moody's Ratings to Default Probabilities.

The Loss Distribution, all risk quantities on a portfolio level are based on the portfolio loss variable L_{PF} . There it does not come much as a surprise that the distribution of L_{PF} , the so-called loss distribution of the portfolio, plays a central role in credit risk management. In Figure 1.2 it is illustrated that all risk quantities of the credit portfolio can be identified by means of the loss distribution of the portfolio. This is an important observation, because it shows that in cases where the distribution of the portfolio loss can only be determined in an empirical way one can use empirical statistical quantities as a proxy for the respective “true” risk quantities.

In practice there are essentially two ways to generate a loss distribution. The first method is based on Monte Carlo simulation; the second is based on a so-called analytical approximation.

In a Monte Carlo Simulation, losses are simulated and tabulated in form of a histogram in order to obtain an empirical loss distribution function can be determined as follows:

Assume we have simulated n potential portfolio losses $L_{PF}^{(1)}, \dots, L_{PF}^{(n)}$, hereby taking the driving distributions of the single loss variables and their correlations into account. Then the empirical loss distribution function is given by

$$F(x) = \frac{1}{n} \sum_{j=1}^n 1_{(0,x)} (L_{PF}^{(j)})$$

Figure 2 shows the shape of the density (histogram of the randomly generated numbers of the empirical loss distribution of some test portfolio. From the empirical loss distribution we can derive all the portfolio risk quantities introduced .

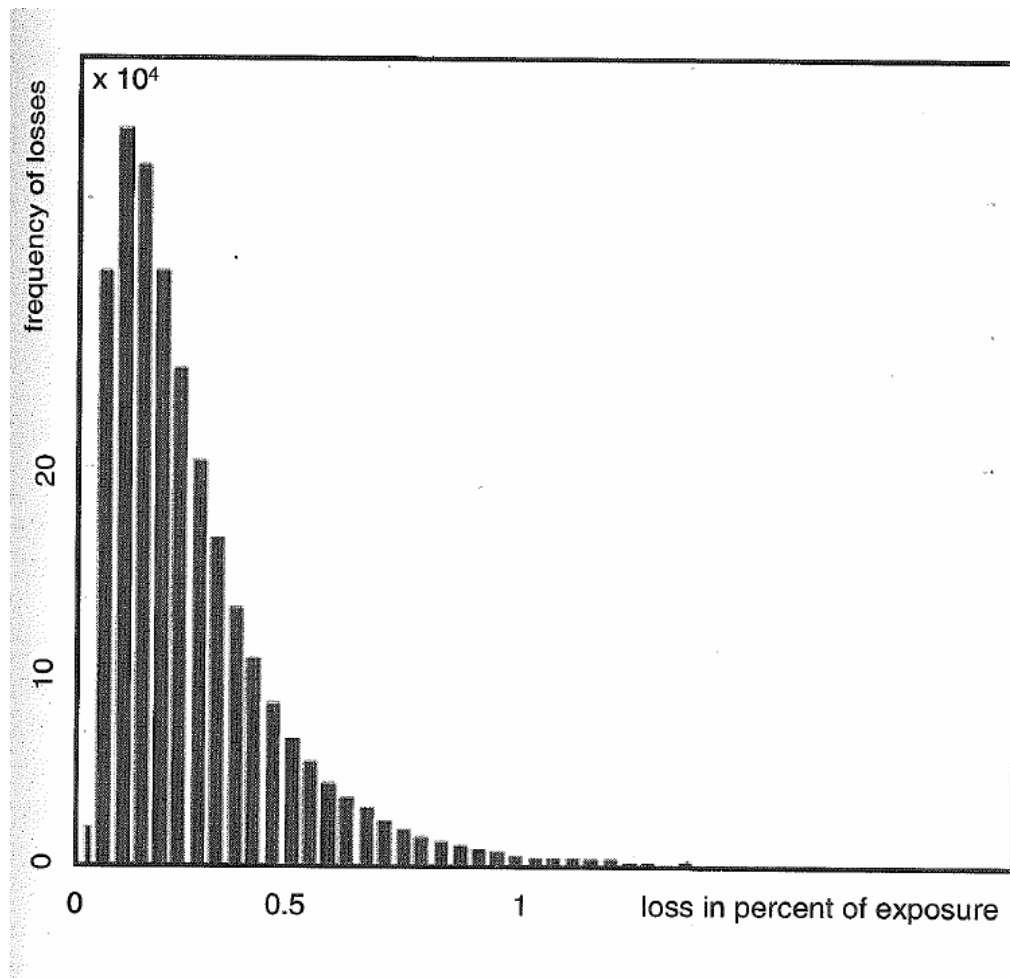


Figure 2 An Empirical Portfolio Loss Distribution¹⁸
 (The distribution based on Monte Carlo simulation. The histogram is based on a portfolio of 2,000 middle-size corporate loans.)

Approaching the loss distribution of a large portfolio by Monte Carlo simulation always requires a sound factor model. The classical statistical reason for the existence of factor models is the wish to explain the variance of a variable in terms of underlying factors. Despite the fact that in credit risk we also wish to explain the variability of a firm's economic success in terms of global underlying influences, the necessity for factor models comes from two major reasons.

¹⁸ Bluhm Christian, Overbeck Ludger, Wagner Christoph, 2003 ,p.35.

First of all, the correlation between single loss variables should be made interpretable in terms of economic variables, such that large losses can be explained in a sound manner. For example, by setting an industry factor to a particular fixed value and then starting the Monte Carlo simulation again, one can study the impact of a down- or upturn of the respective industry.

Analytical Approximation maps an actual portfolio with unknown loss distribution to an equivalent portfolio with known loss distribution. The loss distribution of the equivalent portfolio is then taken as a substitute for the true loss distribution of the original portfolio.

From the known characteristics of the original portfolio (rating distribution, exposure distribution, maturities) calculate the first moment (EL) (Expected Loss) and estimate the second (centered) moment (UL2).

Note that the EL of the original portfolio usually can be calculated based on the information from the rating, exposure, and LGD distributions of the portfolio.

Unfortunately the second moment can not be calculated without any assumptions regarding the default correlations in the portfolio. Therefore, one now has to make an assumption regarding an average default correlation ρ . Note that in case one thinks in terms of asset value models, one would rather guess an average asset correlation instead of a default correlation.

Obviously the most critical part of an analytical approximation is the determination of the average asset correlation. Here one has to rely on practical experience with portfolios where the average asset correlation is known. For example, one could compare the original portfolio with a set of typical bank portfolios for which the average asset correlations are known. In some cases there is empirical evidence regarding a reasonable range in which one would expect the unknown correlation to be located. For example, if the original portfolio is a retail portfolio, then one would expect the average asset correlation of the portfolio to be a small number, maybe contained in the interval (1%, 5%). If the original portfolio would contain loans given to large firms, then one would expect the portfolio to have a high average asset correlation, maybe somewhere between 40% and 60%. Just to give another example, the new Basel Capital Accord assumes an average asset correlation of 20% for corporate loans. The average asset correlation in Moody's universe of rated corporate bonds to be

around 25%. Summarizing we can say that calibrating an average correlation is on one hand a typical source of model risk.

In practice, analytical approximation techniques can be applied quite successfully to so-called homogeneous portfolios. These are portfolios where all transactions in the portfolio have comparable risk characteristics, for example, no exposure concentrations, default probabilities in a band with moderate bandwidth, only a few industries and countries. For example many retail banking portfolios and also many portfolios of smaller banks can be evaluated by analytical approximations with sufficient precision.

In contrast, a full Monte carlo simulation of a large portfolio can last several hours, depending on the number of counterparties and the number of scenarios necessary to obtain sufficiently rich tail statistics for the chosen level of confidence.

The main advantage of a Monte Carlo simulation is that it accurately captures the correlations inherent in the portfolio instead of relying on a whole bunch of assumptions. Moreover, a Monte Carlo simulation takes into account all the different risk characteristics of the loans in the portfolio. Therefore it is clear that Monte Carlo simulation is the “state-of-the-art” in credit risk modeling, and whenever a portfolio contains quite different transactions from the credit risk point of view, one should not trust too much in the results of an analytical approximation.

5.4. Recovery Risk

The recoveries in the event of default are not predictable. They depend upon the type of default and numerous factors such as the guarantees received from the borrower.

5.5. Collateral Risk

The existence of a collateral minimizes credit risk if the collateral can be easily taken over and sold at some significant value. Collateralization is an increasingly common way to mitigate credit risk. There are many types of collaterals: cash, financial assets, or any fixed assets such as real estate, planes, ships or fixed equipment. The value of the collateral

depends upon the nature and the market conditions. Fixed equipment often has a low resale value. On the other hand, the value of cash collateral is certain.

5.6. Third-party guarantee risk

Guarantees are contingencies given by third parties to the bank. The head of a group can commit to pay instead of one of its subsidiaries if the latter defaults. When the third-party guarantee is readily enforceable, it turns the credit risk on the borrower into a credit risk on the guarantor. This is not a simple transfer of risk, however, since the risk is that both the borrower and the guarantor default at the same time. The corresponding probability is a joint probability of default. Third-party guarantees transform the default risk of the borrower into a joint default risk of the borrower plus the guarantor.

Recovery risk depends upon the type of default. A payment default does not mean that the borrower will never pay. But it triggers various types of actions, such as renegotiation, up to the obligation to repay all outstanding balances. If no corrective action can be considered, legal procedures take over. In such a case, all commitments of the borrower will be suspended until some legal conclusion is reached. At best recoveries are delayed until the end of the procedure. At worst, there are no recoveries at all because the company is resold or liquidated, and no excess funds are available to repay an unsecured debt.

5.6.1. CAR

Risk-based capital or CAR (Capital At Risk) is the amount of capital which is actually calculated on risk measures. Credit risk is identical for short-run and long-run commitments, even if the second is more risky. The credit risk is also the same for the counterparties which have different ratings. AAA rated counterparties and B rated counterparties are assigned the same amount of capital in spite of huge gap in default rates between those two categories. The regulation measures risk over a portfolio by a simple addition of individual risks for credit risk. This ignores the diversification effects and results in the same measure of risk for widely diversified portfolios and for highly concentrated portfolios.

It is distinct from regulatory capital or from available capital. Regulatory capital is valued with simple forfeits that do not measure the actual risks. The available capital has no reason to coincide with the economic capital.

The derivation of credit risk includes three random variables: default rate, exposure and recoveries. The determination of worst-case values is easier when only one variable is assumed uncertain.

Ignoring recoveries, unexpected losses depend upon default probability and exposure. We assume, as an example, that the average default rate of a given risk class is 1%, and that its maximum upward deviation is 2%. The expected value of exposure is set at 1,000, the current exposure, and it is assumed to be certain. The expected loss is $1\% \times 1,000 = 10$. the maximum upward deviation of the loss, or unexpected loss, is $2\% \times 1,000 = 20$

But these expected and unexpected losses are based only on default risk. If there is also an exposure risk, the calculation is different.

Default Rates can be derived from historical time series data on default rates for various risk classes. The usage of this data requires that a rating be defined. The rating can be that of external agencies, or internal rating plus the correspondance with external ratings. This information serves to associate default statistics with internal ratings.

5.7. RISK-ADJUSTED Performance

Performance is traditionally measured with accounting data, such as margins or return on equity. But in the financial universe, there is no performance level without a price to pay in terms of risk. Hence, only the risk reward combination is meaningful. When risk is omitted, a number of important issues have no solution:

- ❑ How can the performances of individual transactions, or business units, be compared without adjustment for risk?
- ❑ How can the risk be priced to counterparties?
- ❑ How can the total risk be allocated to business units or transactions?¹⁹

Risk-adjusted profitability addresses those issues. The three main functions of such measures are:

¹⁹ Michael Frenkel, Ulrich Hammer, Marcus Rudolf, Guntar Dufoj, **Risk Management: Challenge and Opportunity**, 1st Edition, Berlin: Springer, 2005, p. 61, 62.

- ❑ The reporting and the comparison of profitability and risk across business units, products and customers, and with the profitability targets
- ❑ The aid for pricing risks
- ❑ The allocation of risks and capital across business units, products and customers, based on the risk-return profile.

The methodology of risk-adjusted performance measurement is based on the economic capital or CAR. CAR serves as the basis for the adjustment of profitability because it captures all types of risks in a single figure.

5.8. RAROC Measures

“RAROC is the expected net risk adjusted profit (ENRAP) divided by the economic capital that is required to support the transaction. It treats all transactions as if they are the buying and selling of securities for an investment portfolio. The price of the security is the amount of economic capital that the shareholder must put aside for the transaction to happen. The return on the transaction is the net increase in value. For a loan transaction, this is the interest income on the loan, plus any fees(F), minus interest to be paid on debt, minus operating costs and minus any losses.

The interest income on the loan asset is the initial loan amount (A_0) multiplied by the interest rate on the loan (r_A). The interest to be paid on the debt is the amount of debt (D_0) multiplied by the interest rate on the debt (r_D). The amount of debt required is the loan amount minus the economic capital. The RAROC equation for a loan is therefore as follows:

$$\text{RAROC} = \frac{A_0 \times r_A + F - D_0 \times r_D - OC - L}{EC}^{20}$$

The two basic variants of risk-adjusted ratios are known as RORAC or RAROC. The RORAC, or Return On Risk-Adjusted Capital, is a profitability calculated on risk-based capital; RAROC, or Risk-Adjusted Return On Capital, adjusts the return for risks, for instance by calculating margins net of statistical defaults. The expected loss should be deducted from expected margins, and these net margins should be related to the capital necessary to absorb unexpected loss.

²⁰ Marrison, p.116.

The RAROC ratio adjusts the earnings by the expected by the expected loss (EL) and uses CAR as a measure of unexpected loss (UL) :

$$\text{RAROC} = \frac{\text{Earnings} - \text{Expected Loss (EL)}}{\text{CAR (or UL)}}$$

The earnings can be defined at various levels. Earnings can be limited to the net interest margin, excluding fees, or they can be defined as the net interest margin plus fees. They can be calculated both before and after operating costs. The minimum value of the required ratio obviously depends upon the perimeter of the earnings calculation.

5.9. Hurdle Rate

The hurdle rate is the minimum required return. The benchmark is the price of risk in the capital market. The hurdle rate should be set equal to the return required by shareholders.

$$R(\%) = \text{earnings (interest plus fees net of operating costs)} / \text{CAR} \geq 25\%$$

Or

$$\text{Earnings (interest plus fees)} \geq 25\% \times \text{CAR}$$

5.10. Earnings

The financial earnings include the interest margin plus fees. The operating costs allocated to a transaction or a portfolio include direct costs and overhead.

Financial Earnings include:

- ☐ The interest margin
- ☐ The upfront fees plus the recurring fees.

The total is the overall margin generated by a transaction. It is called the " All-In Spread" because it includes all fees. The upfront fee increases the margin during the early life of the

transaction. This makes the all-in spread higher in the early stage and lower in the later periods. To avoid such a distortion, a solution is to calculate the All-In Spread which averages all fees over the life of the transaction. The All-In spread can be expressed as a value or as a percentage of outstanding balances, and includes all financial earnings.

Some revenues are not linked to exposure or usage of credit lines by borrowers. They include the revenues from services and money transfers, which are related to the number of transactions, for instance. They should also be added to financial revenues on a consolidated basis, but they are not easy to allocate to any given facility.

5.11. Calculation of RAROC For Credit Risk

The calculation is based on a specified horizon for measuring risk and earnings, the expected and the unexpected losses derived from exposure, default rates and recoveries and the time profile of earnings over the horizon.

5.11.1. RISK-BASED Pricing

A direct application of RAROC (Risk Adjusted Return of Capital) is to determine the appropriate customer price given risk. The example is based upon an exposure of 1000, with a 100 weight for the Cooke ratio, a cost of debt of 10%, and operating costs equal to 2% of exposure. The customer rate should cover the cost of debt and operating expenses and provide a return on capital of 25% before tax. The cost of capital can be included with its full cost of 25% when debt is defined as total assets minus capital. Or it can be included as the differential cost of equity and debt when the cost of debt is calculated for a debt equal to 100% of assets. The differential cost of capital over that of debt is the risk premium. It is zero when there is no risk, and it increases proportionally with CAR.

Table 2 Risk-Based Pricing

Source: Joel Bessis ,Risk Management In Banking, , New York: John Wiley & Sons,
1997, p.268

Items	Low Risk 1	High Risk
Exposure, E	1,000	1,000
Economic Capital, CAR	40	80
Expected loss, EL	0.01	0.01
CAR/E	0.04	0.12
Minimum RAROC	0.25	0.25
Operating Costs (b)	0.02	0.02
Cost of Debt, i (c)	0.1	0.1
Differential cost of capital, 25%-i	0.15	0.15
Calculation based on Economic Capital		
Risk Premium, $CAR \times (25\% - i) / E$ (f)	0.006	0.018
Price ($g = a + b + c + f$)	0.136	0.148
Margin ($g - c$)	0.036	0.048

Table 3 RAROC Calculation

Source: Joel Bessis ,Risk Management In Banking, , New York: John Wiley & Sons, 1997, p.269.

Exposure	1,000
Percentages as % of outstanding balance	
Expected default rate	1%
Maximum upward deviation of the rate	3%
Margin	3%
Cost of Equity (before taxes)	25%
Yearly RAROC	
Expected loss	10
CAR	30
Margin	30
-Expected loss	-10
Net Margin	20
Cost of Equity (25% x 20)	7.5
RAROC	67%
Economic Income Statement Before Operating Costs	
+ Revenues (margins and fees)	30
-Expected loss	-10
Contribution before operating costs	20
CAR	30
Cost of Capital	7.5
RAROC before operating costs	67%
Economic Income Statement After Operating Costs	
+ Revenues	30
-Expected loss	10
Revenues of Net Expected Loss	20
-Direct costs(allocated by product line)	3
-Overhead allocation	2
Operating Income	15
CAR	30
-Cost of Capital	7.5
RAROC (Hurdle Rate = 25% Before Taxes)	50%

6 CREDIT RISK MODELS

“Predictors of credit (or default) risk, the risk that a borrower does not fulfil its debt contract, are of natural interest to practitioners in the financial industry as well as to regulators. The accuracy of these predictors is essential for sound risk management and for supervisory evaluation of the vulnerability of lender institutions. In an appreciation of this new capital adequacy framework (Basel II) encourages the active involvement of banks in measuring the likelihood of defaults. The growing need for reliable measures of credit risk prompts the question whether they can be obtained from academic theoretical models.”²¹

‘The techniques have evolved over the last 20 years. These innovations were prompted by a number of secular forces, including the following:

- ❑ Deregulation, which has stimulated financial innovation and enabled new entrants to provide services
- ❑ The broadening of the credit markets to encompass new borrowing sectors, both domestically and internationally
- ❑ A continuing shift from balance sheet lending to cash flow lending
- ❑ An increase in off-balance sheet risks
- ❑ Shrinking margins on loans, which have forced banks to explore less costly ways of measuring and managing credit risk
- ❑ Securitization, which has prompted the development of more efficient (and standardized) credit risk tools
- ❑ Advance in finance theory, which have provided new ways of looking at credit risk’²²

Factor models are a well established technique from multivariate statistics, applied in credit risk models, for identifying underlying drivers of correlated defaults and for reducing the computational effort regarding the calculation of correlated losses.

Assume we have two firms A and B which are positively correlated. For example, let A be DaimlerChrysler and B stand for BMW. Then, it is quite natural to explain the positive correlation between A and B by the correlation of A and B with an underlying factor. We

²¹ Nikola A Tarashev, “An empirical evaluation of structural credit risk models”, **BIS Working Papers**, No:179, July 2005

²² John B. Caouette, Edward I. Altman, Paul Narayanan, p.102,105.

could think of the automotive industry as an underlying factor having significant impact on the economic future of the companies A and B. Of course there are probably some more underlying factors driving the riskiness of A and B. For example DaimlerChrysler is to a certain extent also influenced by a factor for Germany, the United States, and eventually by some factors incorporating Aero Space and Financial Companies. BMW is certainly correlated with a country factor for Germany and probably also with some other factors. However the crucial point is that factor models provide a way to express the correlation between A and B exclusively by means of their correlation with common factors. For example, assume that the automotive industry gets under pressure. Then we can expect that companies A and B also get under pressure, because their fortune is related to the automotive industry. The part of the volatility of a company's financial success related to systematic factors like industries or countries is called the systematic risk of the firm. The part of the firm's asset volatility that can not be explained by systematic influences is called the specific or idiosyncratic risk of the firm.

6.1. Credit Risk Model +

'Since the beginning of the 1990s, Credit Suisse First Boston ('CSFB') has been developing and deploying new risk management methods. In 1993, Credit Suisse Group launched, in parallel, a major project aimed at modernising its credit risk management and using CSFB's expertise, at developing a more forward-looking management tool. In December 1996, CSFB introduced CreditRisk+

Current areas of development in credit risk management include: modelling credit risk on portfolio basis; credit risk provisioning; active portfolio management; credit derivatives; and sophisticated approaches to capital allocation that more closely reflect economic risk than the existing regulatory capital regime.²³

CreditRisk+ is based on a portfolio approach to modelling credit default risk that takes into account information relating to size and maturity of an exposure and the credit quality and systematic risk of an obligor. This model is a statistical model of credit default risk that makes no assumptions about the causes of default. This approach is similar to that taken in market risk management, where no attempt is made to model the causes of market price movements. Model considers default rates as continuous random variables and incorporates the volatility of default rates in order to capture the uncertainty in the level of default rates.

²³ Credit Suisse First Boston, CreditRisk+ Model, Retrieved January 11, 2006 from URL: <https://s.research-and-analytics.csfb.com>

6.2. Moody's Default Model

Commercial lending is certainly nothing new, and neither are the statistical models designed to study its risks. Written records from Sumer circa 3000 B.C. indicate that interest rates were between 15 and 33%. In terms of analyzing the risks involved, lenders have examined accounting ratios since at least the 19th century (Dev (1974)). But the modern era of commercial default prediction really begins with the work of Beaver and Altman in the late 1960s.

How did consumer credit modeling leapfrog commercial credit modeling? Data. Hundreds of thousands of bad credit card debts and millions of good ones make for confident inference. In contrast, if one examines 30 of the major academic papers on commercial default models over the past 30 years, the median number of defaulting companies used in these studies is 40.

RiskCalc targets the middle market class of borrowers. Other models aimed at this segment include Altman's Z-Score model. These models use financial statement data to predict default.

RiskCalc is at the heart of the commercial credit evaluation process. It is for firms too large to be considered a simple extension of an individual, yet without publicly traded equity information.

Credit analysts know that to gauge risk you have to know relative values; that is, leverage can only be determined to be high if the leverage ratio's average value is known. Given that some of these ratios vary systematically by industry.²⁴

²⁴ Moody's Investors Service, "RISKCALC For Private Companies, Moody's Default Model, Rating Methodology" (Retrieved: May 10, 2005), May 2000, www.moodysrms.com

6.3. Altman Z-Score Model

The 1968 model used discriminant analysis to predict bankruptcy. While the model was originally developed from samples of a closed industry environment (manufacturing), it is reported to provide a very high distress predictive confidence for up to two years prior to failure on nonmanufacturing firms as well. A number of other bankruptcy predictors have been published with some in use, but no distress model has been so thoroughly tested and widely accepted as this one.

The detection of company operating and financial difficulties is a subject which has been particularly amenable to analysis with financial ratios. Prior to development of quantitative measures of company performance, agencies were established to supply a qualitative type of information assessing the credit-worthiness of particular merchants. (For instance, the forerunner of the well-known Dun & Bradstreet, Inc. was organized in 1849 in Ohio in order to provide independent credit investigations). Formal aggregate studies concerned with portents of business failure were evident in the 1930's.

One of the classic works in the area of ratio analysis and bankruptcy classification was performed by Beaver (1967). In a real sense, his univariate analysis of a number of bankruptcy predictors set the stage for multivariate attempts, by this author and others, which followed. Beaver found that a number of indicators could discriminate between matched samples of failed and nonfailed firms as long as five years prior to failure.

The aforementioned studies imply a definite potential of ratios as predictors of bankruptcy. In general, ratios measuring profitability, liquidity, and solvency prevailed as the most significant indicators.

For instance, a firm with a poor profitability and/or solvency record may be regarded as potential bankrupt. However, because of its above average liquidity, the situation may not be considered serious.

The questions are (1) Which ratios are most important in detecting bankruptcy potential, (2) What weights should be attached to those selected ratios, and (3) How should the weights be objectively established.

6.3.1. Discriminant Analysis

After careful consideration of the nature of the problem and of the purpose of this analysis, I chose multiple discriminant analysis (MDA) as the appropriate statistical technique. Although not as popular as regression analysis, MDA has been utilized in a variety of disciplines since its first application in the 1930's. MDA is a statistical technique used to classify an observation into one of several a priori groupings dependent upon the observation's individual characteristics. It is used primarily to classify and/or make predictions in problems where the dependent variable appears in qualitative form, for example, male or female, bankrupt or nonbankrupt. Therefore, the first step is to establish explicit group classifications.²⁵

The Final Discriminant function is as follows:

$$Z = 0.012X_1 + 0.014X_2 + 0.033X_3 + 0.006X_4 + 0.999X_5$$

Where

X_1 = working capital/total assets

X_2 = retained earnings/total assets

X_3 = earnings before interest and taxes / total assets

²⁵ Blaise Ganquin, John Bilardello, **Fundamentals Of Corporate Credit Analysis**, Second Edition, New York: McGraw Hill, 2005, p.300,301.

X_4 = market value equity/book value of total liabilities

X_5 = sales/total assets, and

X_1 = Working capital/Total Assets

The working capital/total assets ratio measures the net liquid assets of the firm relative to the total capitalization. Working capital is defined as the difference between current assets and current liabilities. Liquidity and size characteristics are explicitly considered. Ordinarily, a firm experiencing consistent operating losses will have shrinking current assets in relation to total assets. Of the three liquidity ratios evaluated, this one proved to be most valuable. Two other liquidity ratios tested were the current ratio and the quick ratio. There were found to be less helpful and subject to perverse trends for some failing firms.

X_2 = Retained Earnings/Total Assets

Retained earnings is the account which reports the total amount of reinvested earnings and/or losses of a firm over its entire life. The account is also referred to as earned plus. It should be noted that the retained earnings account is subject to "manipulation" via corporate quasi-reorganizations and stock dividend declarations. This measure of cumulative probability over time is what I referred to earlier as a "new" ratio. The age of a firm is implicitly considered in this ratio. For example, a relatively young firm will probably show a low RE/TA ratio because it has not had time to build up its cumulative profits. Therefore, it may be argued that the young firm is somewhat discriminated against in this analysis, and its chance of being classified as bankrupt is relatively higher than that of another older firm, *ceteris paribus*. But, this is precisely the situation in the real world. The incidence of failure is

much higher in a firm's earlier years. In 1993 ,approximately 50% of all firms that failed did so in the first five years of their existence (Dun & Bradstreet,1994)

In addition the RE/TA measures the leverage of a firm. Those firms with high RE,relative to TA,have financed their assets through retention of profits and have not utilised as much debt.

$X_3 = \text{Earnings Before Interest and Taxes} / \text{Total Assets}$

This ratio is a measure of the true productivity of the firm's assets, independent of any tax or leverage factors. Since a firm's ultimate existence is based on the earning power of its assets, this ratio appears to be particularly appropriate for studies dealing with corporate failure. Furthermore, insolvency in a bankrupt sense occurs when the total liabilities exceed a fair valuation of the firm's assets with value determined by the earning power of the assets. As we will show,this ratio continually outperforms other profitability measures, including cash flow.

$X_4 = \text{market value equity/book value of total liabilities}$

Equity is measured by the combined market value of all shares of stock, preferred and common, while liabilities exceed the assets and the firm becomes insolvent. For example, a company with a market value of its equity of \$1,000 and debt of \$500 could experience a two-thirds drop in asset value before insolvency. However the same firm with \$250 equity will be insolvent if assets drop only one-third in value. This ratio adds a market value dimension which most other failure studies did not consider. The reciprocal of X_4 is a slightly modified version of one of the variables used effectively by Fisher (1959) in a study of corporate bond yield-spread differentials. It also appears to be a more effective predictor of bankruptcy than a similar, more commonly used ratio;net worth/total debt (book values). At a later point, we will substitute the book value of net wort for the market value in order to derive a discriminant function for privately held firms(Z') and for non-manufacturers (Z'')

More recent models such as the KMV approach, are essentially based on the market value and its volatility. The equity market value serves as a proxy for the firm's asset values.

$X_5 = \text{Sales} / \text{Total assets}$

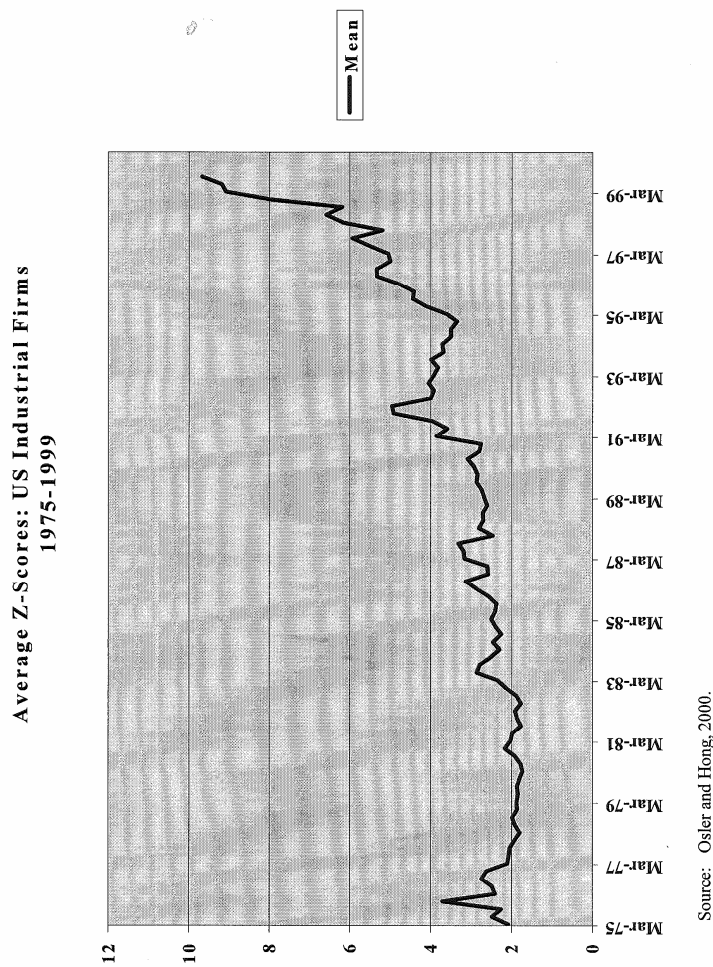
The capital-turnover ratio is a standard financial ratio illustrating the sales generating ability of the firm's assets. It is one measure of management's capacity in dealing with competitive conditions. This final ratio is quite important because it is the least significant ratio on an individual basis. In fact, based on the univariate statistical significance test, it would not have appeared at all. However, because of its unique relationship to other variables in the model, the sales/total assets ratio ranks second in its contribution to the overall discriminating ability of the model.

Finally

$Z > 2.99$: classified as financially sound

$Z < 1.81$: classified as financially distressed or bankrupt

Figure 3 Average Z-Score: US Industrial Firms (1975-1999)



A Revised Z-Score Model

Rather than simply insert a proxy variable into an existing model to calculate Z-scores, Altman advocates a complete reestimation of the model, substituting the book values of equity for the Market Value in X_4 .

One expects that all of the coefficients will change (not only the new variable's parameter) and that the classification criterion and related cutoff scores would also change.

The results of our revised Z-Score model with a new X_4 is

$$Z' = 0.717X_1 + 0.847X_2 + 3.107X_3 + 0.420X_4 + 0.998X_5$$

the equation now looks different than the earlier model; note, for instance, the coefficient for X_1 went from 1.2 to 0.7. But the model looks quite similar to the one using Market Values. The actual variable that was modified, X_4 , showed a coefficient change to 0.42 from 0.6001; that is, it now has less of an impact on the Z-score. X_3 and X_5 are virtually unchanged. the univariate F-test for the book value of X_4 (25.8) is lower than the 33.3 level for the market value but the scaled vector results show the revised book value measure is still the third most important contributor.

Table-5 lists the classification accuracy, group means, and revised cutoff scores for the Z'-Score model. The Type I accuracy is only slightly less impressive than the model utilizing market value of equity (91% vs. 94%) but the Type II accuracy is identical (97%). The nonbankrupt group's mean Z'Score is lower than that of the original model (4.14 vs. 5.02). Therefore, the distribution of scores is now tighter with larger group overlap. The gray area (or ignorance zone) is wider, however, since the lower boundary is now 1.23 as opposed to 1.81 for the original Z-score model. All of this indicates that the revised model is probably somewhat less reliable than the original, but only slightly less. Due to lack of a private firm data base, we have not tested this model extensively on secondary sample distressed and nondistressed entities.

The Zeta model for assessing bankruptcy risk of corporations demonstrates improved accuracy over existing failure classification model (Z-Score) and, perhaps more importantly, is based on data more relevant to current conditions and to a larger number of

industrial firms. The ZETA model's bankruptcy to 70 % five annual reporting periods prior. We have assessed the effect of several elements involved with the application of discriminant analysis to financial problems. These include linear vs. Quadratic analysis for the original and holdout samples, introduction of prior probabilities of group membership and costs of error estimates into the classification strategies.

The potential applications of the ZETA bankruptcy identification model are in the same spirit as previously developed models. These include credit worthiness analysis of firms for financial and non-financial institutions, identification of undesirable investment risk for portfolio managers and individual investors and to aid in more effective internal and external audits of firms with respect to going-concern considerations, among others.

Reasons for attempting to Construct a New Model

There are five valid reasons why a revised Z-Score bankruptcy classification model can improve and extend upon those statistical models which had been published in the literature in the prior decade. These include:

The change in the size, and perhaps the financial profile, of business failures. The average size of bankrupt firms had increased dramatically with the consequent greater visibility and concern from financial institutions, regulatory agencies and the public at large. Most of the past studies used relatively small firms in their samples with the exception of Altman's (1973) railroad study and the commercial bank studies. Any new model should be as relevant as possible to the population to which it will eventually be applied. This present study utilizes a bankrupt firm sample where the average asset size two annual reporting periods prior to failure was approximately \$100 million. No firm had less than \$20 million in assets.

Following above, a new model should be as current as possible with respect to the temporal nature of the data.

Past failure models concentrated either on the broad classification of manufacturers or on specific industries.

7 RATING

The main problem faced by banks is obtaining information about companies that have not issued traded debt instruments. The data about these companies are of unproven quality and are therefore less reliable, and it can be a challenge to extract the minimum required information in order to improve the allocation of credit.

Both the business risk and financial risk of a company are analyzed in assigning a credit rating. There are no fixed rules, subjectivity is at the heart of every rating.²⁶ The credit analysts must take into consideration many attributes of a firm: financial as well as managerial, quantitative as well as qualitative. The analysts must ascertain the financial health of the firm, and determine if earnings and cashflows are sufficient to cover the debt obligations. The analysts would also want to analyze the quality of the assets of the firm and the liquidity position of the firm.

In addition, the analysts must take into account the features of the industry to which the potential client belongs, and the status of the client within its industry. The effects of macro-economic events on the firm and its industry should also be considered, as well as the country risk of the borrower. Combined industry and country factors can be assessed to calculate the correlation between assets for the purpose of calculating portfolio effects.

The credit analyst must assess in order to determine the creditworthiness of the borrower and thus the interest spread that the bank should charge. A major consideration in providing a loan is the existence of a collateral, or otherwise of a loan guarantor, and the quality of the guarantee. This issue of guarantee is especially important for financial institutions providing loans to small and medium-sized companies that cannot offer sufficient collateral.

When rating a borrower one must decide whether to grade borrowers according to their current conditions (point-in-time rating assessment), or their expected creditworthiness over the life of the loan or the entire credit cycle ("through-the-cycle" rating assessment).

²⁶ Marshall E. Blume, Felix Lim, A. Craig Mackinlay, "The Declining Credit Quality of U.S. Corporate Debt: Myth or Reality?", **The Journal of Finance**, Vol. LIII, No.4, (August, 1998) p.1391.

This decision depends on the objective of the rating system. Along horizon, through-the-cycle approach is used when the purpose of the rating system is to assist in lending or investment decisions. Loan officers generally consider potential stress conditions in the lending decisions and in structuring a transaction(covenants, loan amount, term, collateral, guarantee) over the life of the loan. It involves estimating the borrower's condition at the worst point in a credit cycle, and grading according to the risk at that time. It is therefore expected that agencies' ratings stay stable over the credit cycle, and to be adjusted only when the borrower experiences a major shock that affects its long-term condition.

Conversely, when the objective is to allocate economic capital, monitor loans and establish loan reserves, the point-in-time approach is more appropriate. The credit horizon for these decisions is usually one year, and the rating decision is based on the borrower's current and most likely future outlook over the credit horizon. Point-in-time rating is more a responsive to change in the credit status of the obligor, and therefore more appropriate to monitor a credit.

7.1. Rating Agencies

It started at the beginning of the century, at approximately the same time that the first papers and articles were published on the analysisi of accounting ratios, as a means of diagnosing the financial strenght of a company. By the 1920s this approach had been commercialised and specialized firms were offering their services, and promoting the merits of ratio analysis. This was also the period when Moody's (1909), S&P (1926) and other agencies started to rate public debt issues.

'In the words of S&P, " A credit rating is S&P's opinion of the general creditworthiness of an obligor, or the creditworthiness of an obligor with respect to a particular debt security or other financial obligation, based on relevant risk factors.

S&P Rating services traces its history back to 1860. It currently is the leading credit rating organization and a major publisher of financial information and reserach services on U.S. and foreign corporate and municipal debt obligations.

S&P now rates more than \$13 trillion in bonds and other financial obligations of obligors in more than 50 countries. S&P rates and monitors developments pertaining to these issues and issuers from an office network based in 21 world financial centers. A credit rating is S&P's opinion of the general creditworthiness of an obligor, or the credit worthiness of an obligor with respect to a particular debt security or other financial obligation, based on relevant risk factors. Credit ratings are based on information furnished by the obligors or obtained by us from other sources we consider reliable. S&P does not perform an audit in connection with any credit rating and may, on occasion, rely on unaudited financial information. Credit ratings may be changed, suspended, or withdrawn as a result of changes in, or unavailability of, such information.

A short-term credit rating is an assessment of an issuer's credit quality with respect to an instrument considered short-term in the relevant market.²⁷

Long-term credit ratings are divided into several categories, ranging from 'AAA'-reflecting the strongest credit quality to 'D' reflecting the lowest. Long term ratings from 'AA' to 'CCC' may be modified by the addition of a plus or minus sign to show relative standing within the major rating categories. Long-term credit ratings are related to the higher default rates than the short-term ratings. According to Moody's ratings; default probability of the rate "A" for one year credit period is 0%, besides that, default probability of the rate "A" for ten years credit period can increase to 2%.²⁸

7.2. Creating Rating System

An internal rating system helps financial institutions manage and control credit risks they incur through lending and other operations by grouping and managing the creditworthiness of borrowers and the quality of credit transactions.

For a long time, many financial institutions managed credit risks by monitoring only the creditworthiness of each borrower. The process for making lending decisions was quite basic, and often only yes/no decisions were made. Even if borrowers went bankrupt, however losses were often sufficiently covered by real estate collateral.

²⁷ Standard & Poor's, "Corporate Rating Criteria", 2005 , www.corporatecriteria.standardandpoors.com (Retrieved : February 5,2006),(p.25,27)

²⁸ A.Sait Yüksel.Aslı Yüksel, Ülku Yüksel, Bankacılık Hukuku ve İşletmesi, İstanbul: Beta Basım Yayım, 10th edition, 2004, p.141.

After the bursting of economic bubble, credit costs increased significantly at financial institutions due to the rising number of bankrupt borrowers and the falling value of collateral. Credit risk control therefore became an important management requiring reconsideration. In addition, changes in the macroeconomic environment forced financial institutions to seek a more reliable credit risk management framework. Hence, the method of statistically managing and analyzing credit risk through an internal rating system became widely used. More financial institutions, including small banks, started adopting internal rating systems to categorize borrowers especially after 1998.

Such a system enables banks to efficiently make lending decisions and manage loans with less administrative work. Second, it makes easier to grasp the creditworthiness of borrowers and the quality of credit transactions using a single yardstick. Moreover, the assessment of the credit quality of the entire portfolio becomes possible by monitoring changes in the amount of credit exposure and number of borrowers in each rating grade. It also becomes possible to quantify credit risk through estimation of the possibility of default by rating grade.

Figure 4 Rating Process

Source: Standard & Poor's, "Corporate Rating Criteria", 2005 ,
www.corporatecriteria.standardandpoors.com



The internal rating system is the prerequisite for advanced credit risk management, and each financial institutions is expected to develop its own internal rating system. Every institution faces a different business environment, so each system should have its own design. For example, a more simple framework might be suitable for small institutions. There is no single answer for the framework of internal rating systems, such as the number of rating grades, a definition of each rating grade, and the method of rating assignments. Financial institutions need to introduce their own system depending on the characteristics of their loan portfolios, their operations, the objectives of the rating system.

The following are four important points for consideration in establishing an internal rating system.

☒ Architecture of the internal rating system

What are the key factors in building the structure of the rating system?

☒ Rating process and rating models

How should information on individual borrowers and loan contracts be linked to the ratings?

☒ Estimation of risk components and quantification of credit risk

How should components and sizes of risk be calculated using rating information?

☒ Active use and validation of the system

How should the system continue to operate smoothly and be improved continually?

It is sometimes argued that small financial institutions with a relatively small number of borrowers do not need internal rating systems. This is based on the perception, for example, that a statistical approach is not necessarily efficient in managing credit risk of loan portfolios with a limited number of borrowers and that the establishment and management of a system is far too expensive.

However, even small institutions can have a considerable number of borrowers, whose credit quality may vary significantly. It also enables financial institutions to conduct more efficient risk management through close monitoring of high-risk borrowers, for example, by taking preemptive actions against further downgraded ones. Furthermore, financial institutions can gain a better understanding of the quality of their entire loan portfolios in a comprehensive way by monitoring developments in internal ratings, including the degree of concentration on certain borrower rating grades and the number of upgrades/downgrades.

For borrower ratings grades for each borrower are usually decided based on evaluation using quantitative information, such as financial indicators regarding the borrower, and qualitative information, such as industry trends, and extension of financial support from parent companies. A quantitative rating model is often used for quantitative evaluation of individual borrowers. Financial indicators that have a close statistical relationship with defaults are used in this model.

If quantitative financial data are insufficient to accurately measure the creditworthiness of borrowers, qualitative analysis should be used to make necessary adjustments.²⁹

²⁹ Advancing Credit Risk Management Through Internal Rating Systems, September 2005, Bank Of Japan

Table 4 Examples of Quantitative Factors Determining Borrower Ratings

Source: Standard & Poor's, "Corporate Rating Criteria", 2005 ,

www.corporatecriteria.standardandpoors.com

TYPE OF FACTOR	EXAMPLES
Size Of Operation	Amount of Capital and Net Assets
Safety	Current ratio, Capital Adequacy ratio, and Current Account balance Ratio
Profitability	Return on Assets, Operating profits, Interest Coverage Ratio
Others	Rate of Growth in Sales and Profits

Table 5 Examples of Qualitative Factors Determining Borrower Ratings

Source: Standard & Poor's, "Corporate Rating Criteria", 2005 ,

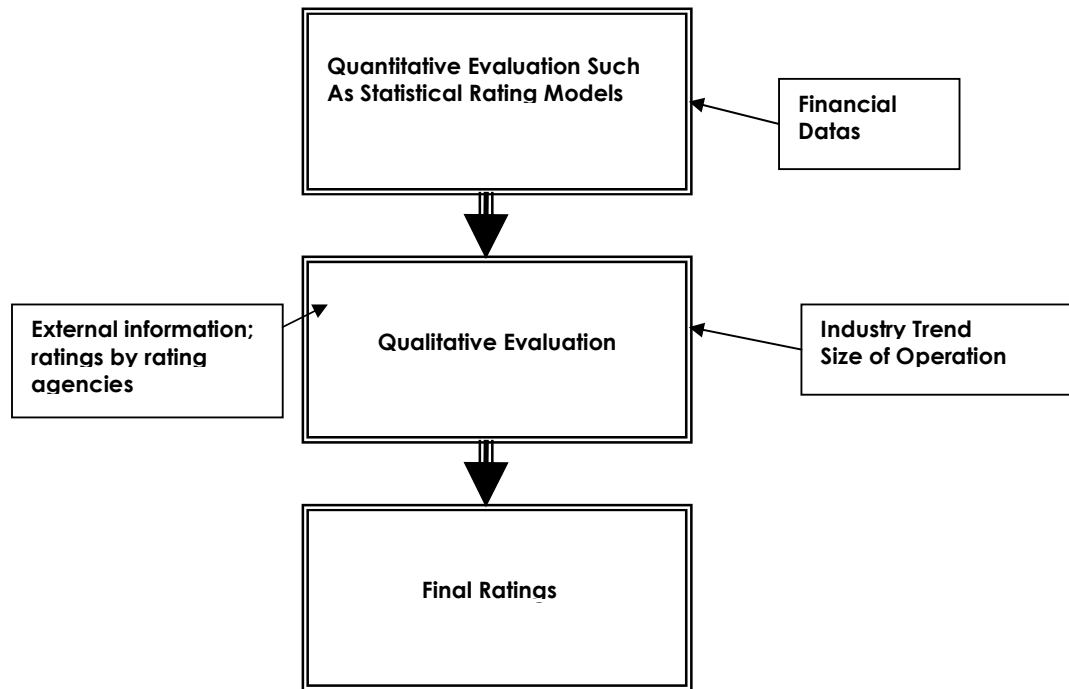
www.corporatecriteria.standardandpoors.com

TYPE OF FACTOR	EXAMPLES
Industry	Growth potential , Size of market fluctuations, and Entry Barriers
Firm	Ownership relations withy parent companies or affiliate firms, the management's ability, and existence of an external audit system.

Figure 5 Examples of Qualitative Factors Determining Borrower Ratings

Source: Standard & Poor's, "Corporate Rating Criteria", 2005 ,

www.corporatecriteria.standardandpoors.com



Rating categories, typically letter labeled (AAA or Aaa for prime quality) or simply numbered (1 to 10 , say) are a shorthand to quantify credit risk. On the basis historical data, ratings can be related to the relative frequency of defaults (default-mode paradigm), or they become the basis for the valuation of an asset (mark-to-model paradigm). The most prominent application relates to corporate asset-liability management, where risk-adjusted return on capital (RAROC) numbers are used to benchmark divisional performance. Ratings allow to measure credit risk, and to manage consistently a bank's credit portfolio, i.e. to alter the banks' exposure with respect to type of risk. In particular, ratings are useful for the pricing of a bond or a loan, reflecting an intended positive relation between expected credit risk and nominal return.³⁰

³⁰ Standard & Poor's, "Corporate Rating Criteria", 2005 , www.corporatecriteria.standardandpoors.com (Retrieved : February 5,2006),(p.30)

For all these reasons, the quality of a financial institution's rating system has attracted attention from many parties. Auditing firms discuss the risk reporting systems of a corporation in the annual report, rating agencies evaluate the risk assessment system of a borrower who wants to issue asset backed securities, and supervisory authorities are expected to start soon to certify institutional rating system and credit risk models.

A final remark is in order about the differences between two types of ratings: internal and external. External ratings are generated by rating agencies. These agencies specialize in the production of rating information about corporate or sovereign borrowers, they do not engage in the underwriting of these risks. The rating information is made public, while the rating process itself remains non-disclosed. Internal ratings, in contrast, are produced by financial intermediaries (notably banks) to evaluate the risks they take into their own books.

Ratings and Default Risk

We define a rating of a corporate as the mapping of the POD (Probability of Default), the expected probability of default, into a discrete number of quality classes, or rating categories. The POD is a continuous variable, bounded by zero from below and by one from above.

$$\text{POD:Companies} \longrightarrow (0,1) \quad (1)$$

A POD is the expected relative frequency of a credit event, where the latter is defined as a non-payment of principal or interest due (over a period of at least 30 days). The POD is one component of a lenders' expected loss, as in (2).

$$E(L) = \text{POD} \cdot E(\text{LGD}) \quad (\text{Loss Given Default}) \quad (2)$$

Here, $E(L)$ is expected loss, and $E(\text{LGD})$ is the expected loss given default. The expectations are taken over a common time interval, usually one year in the future. Expected loss is thus the average amount a lender is expecting to lose over the next twelve months.

There are a variety of procedures to arrive at a rating. The typical procedure used today is the scoring method. It relies on a well- defined set of criteria, each of **which is** scored separately. The individual scores relating to the set of criteria are weighted and then added up, yielding overall score. This score is translated in one of the rating classes, defined as an interval on the real line that extends from minimum overall score to its maximum.

‘A well known example is the Z-Score proposed by Edward Altman in 1977. this author has suggested to regress historical default experience on set of accounting variables in order to determine an optimal separating function between issuers that defaulted later on and those that survived. The weights of the estimated function are then used to predict default probability for an individual firm, called Z-Score (see Caouette 1998)³¹

A different approach to rating is exemplified by KMV’s public firm model. Building on option pricing theory KMV, a data vendor, derives default estimates from expected movements of stock prices over a specified period of time, typically one year. In contrast to the scoring approach, there is no need here to collect a variety of firm-related, fundamental information, nor is there any weighting function needed. It only requires a time series of observable stock market prices and an estimate of firm indebtedness

A bank’s rating system should be able to rate all past, current and future clients. This requirement defines the potential set of companies to be rated. A bank’s rating system should be able to cope with all clients possible. It is hard to meet however a bank should make any effort possible to ensure its rating system is flexible enough to cope with all foreseeable types of risk.

A bank should have as many different rating systems as necessary and as few as possible. The reasons for choosing the number of rating systems should be made transparent.

Probabilities of default have to be well defined. This requirement states that a bank has to have a proper definition what its PODs mean. The bank has to define what it considers to be a default event. We found that financial institutions rely on a variety of definitions of a default event, e.g. loan loss provision, or failure to pay interest, or principal over a specified time span

³¹ J.B. Caouette, Edward I. Altman, Paul Narayanan, p.195.

The PODs should be identical for the firms which have same qualifications and of course the ratings also have to be identical.

The rating system can vary in the degree of fineness. It should always be as fine as necessary. The fineness of a rating system cannot be considered independently from back-testing.

The rating system should be reliable. Suppose, that a company has some true POD. Then the rating should be identical regardless of the person who rates, or the point in time when the rating is done. Note, that this requirement does not assume that the rating does not change. The rating might change with the creditworthiness of the client, or along the economic cycle.

Do rating systems really map probabilities of default?

Credit ratings can be technically incorrect, even if applied properly their values do not correspond to the (ex-post) number of realized defaults. In addition, rating systems which are technically correct can be used in a way that the resulting ratings do not mimic PODs anymore.

A POD is based on an ex-ante point of view. It states that a company with an POD of 0.7% has a 7 in a 1000 chance to default within a given time period. We know from research on capital markets that testing expectations is always tricky. In order to relate(ex-ante) expectations to(ex-post) observed data, we have to assume that the structure of the problem under consideration remains constant from the date where expectations are formed to the date where observations are taken.

The (ex-ante) probability of default should not be significantly different from the (ex-post) realized default frequency. Back-testing in credit-management is especially difficult because first, there are no market prices for most types of credits and second, there are so few historical data of credit defaults.

Ex-post default rates within any given rating category should be larger than that of a higher rating category. Ex-post default rates should increase with the time horizon.³²

³² Jan Pieter Krahnen, Martin Weber , "Generally Accepted rating Principles" , **Journal of Banking and Finance**, Vol.25 (2001) p.3,23.

7.3. Stages of Rating System

7.3.1. Financial Assessment (Step 1)

This step formalizes the thinking process associated with a good credit analyst (or good equity analyst) whose goal is to ascertain the financial health of an institution. For instance, the credit analyst would study the financial reports to determine if the earnings and cash flows are sufficient to cover the debt. The credit analyst will study the degree to which the trends associated with these "financials" are stable and positive. The credit analyst would also want to analyze the degree to which the assets are of high quality, and make sure that the obligor has substantial cash reserves (e.g., substantial working capital). The analyst would also want to examine the firm's leverage. Similarly, the credit analyst would also want to analyze the degree to which the firm had access to the capital markets, and whether it has an appropriate flexibility to borrow money.³³

The rating should reflect the financial position and performance of the company and its ability to withstand possibly unexpected financial setbacks.

1. Earnings (E) and cashflow (CF)
2. Asset values (AV), liquidity (LIQ) and leverage (LEV)
3. Financial Size (FS), flexibility (F) and debt capacity (DC)

A measure for earnings/cash flow would include interest coverage such as EBIT/interest expense and EBITDA/interest expense. A measure for leverage would include the current ratio, which is defined as current assets divided by current liabilities. A measure for leverage would include debt to net worth ratios such as total liability/equity.

³³ Michel Crouhy, Dan Galai, Robert Mark "Prototype risk rating system" **Journal of Banking & Finance**, Vol.25 (2001), p.67.

There will be cases and/or industries where one of the three main assessment areas should be more heavily (or lightly) weighted when arriving at the overall financial assessment. The use of good judgement is essential. One should benchmark or relate this assessment to those of other companies in the same industry grouping.

One needs to emphasize the most current year's performance, with some recognition of the previous few years as appropriate when assessing the Earnings&Cashflow category. Cashflow is assessed using whatever methodology is most appropriate to the industry or individual situation (e.g., EBITDA). When assessing companies in cyclical industries one should adjust the financial results and key ratios so that the cyclical effect is incorporated. This is reasonable so long as downturns are within the scope of a normal cycle.

7.3.2. Industry Benchmarks (Step 2)

The analysis of the competitive position and operating environment of a firm helps in assessing its general business risk profile. This leads to the calibration of the quantitative information drawn from the financial ratios for the firm, using industry benchmarks. These ratios summarize information on the profitability and interest coverage of the issuer, on its capital structure, asset protection, and cash flow adequacy. The major ratios considered include.

Major Ratios

1. EBIT interest coverage(x)
2. EBITDA interest coverage(x)
3. Funds from operations/total debt (%)
4. Free operating cashflow/total debt (%)

5. Pretax return on capital (%)
6. Operating income/sales(%)
7. LTD/capital (%)
8. Total debt/capitalization(%)

A company with an excellent business can assume more debt than a company with average business possibilities. For example, a company with an excellent business position will be able to take on a debt to total capitalization ratio of 30% in order to qualify for rating category A.

A risk rating is designed to depict the risk of loss in a credit facility. A robust RR (Risk Rating) should offer a carefully designed, structured and documented series of steps for the assessment of each rating.

The goal is to generate accurate and consistent RRs, yet also to allow professional judgment to significantly influence a rating is appropriate. If a RR is accurately and consistently applied then they provide a common understanding of risk levels and allow for active portfolio management.

What is the horizon over which these estimations are derived? For instance, for the rating system to be consistent with the credit migration approach to modeling credit risk, each rating class should correspond to a range of default probabilities over a one-year period.

Is the number of gradations appropriate to distinguish among the range of risks?

How can the financial institution link the rating to a measurable credit loss?

Are all the appropriate risk factors incorporated?

The steps in the RRs

1. Financial assessment of the borrower,
2. Analyzing the managerial capability of the borrower,
3. Examining the borrower's absolute and relative position within the industry,
4. Reviewing the quality of financial information,
5. Country Risk,
6. Examining the third-party support,
7. Factoring in the maturity of transaction,
8. Reviewing how strongly the transaction is structured,
9. Assessing the amount of collateral.

First one needs to determine which entity(or group of entities) one is rating. For example, the analysis of a group credit involves calculating the OR for the entire group of entities, provided that all the important entities and borrowers are cross-guaranteed. If this is not the case, then one should rate any such borrower individually. If there are businesses or companies in different industries, or with different financial characteristics, then one often focuses on either the dominant entity (if there is one) or a balance of the important components, with a specific recognition of any weak links.

Credit rating systems can also be compared to multivariate credit scoring systems to evaluate their ability to predict bankruptcies rates and also to provide estimates of the severity losses. Altman and Saunders(1998) provide a detailed survey of credit risk measurement approaches. They compare four methodologies for credit scoring.

1. The linear probability models
2. The logit model
3. The probit model
4. The discriminant analysis model

The Logit model assumes that the default probability is logistically distributed, and uses a few accounting variables to predict the default probability. Martin(1977), Watt(1985), Platt and Platt(1991) examine the logit model and find it useful in predicting bankruptcies.

The linear probability model is based on linear regression model and makes use of a number of accounting variables to try to predict the probability of default.

The multiple discriminant analysis (MDA), proposed and advocated by Altman is based on finding a linear function of both accounting and market-based variables that best discriminates between two groups; firms that actually defaulted, and firms that did not default.

The linear models are based on empirical procedures; they search out the variables that seem best at predicting bankruptcies.

7.3.3. Management and other qualitative factors (Step 3)

This approach would require one to examine day-to-day account operations (AO) , assets management (AM), as well as perform an environmental assessment (EA), and examine contingent liabilities (CL),etc..

- If the financial and security reporting is on a timely basis, is it of good quality? Does it satisfactorily explain significant variations from projections?

- If the credit limits and terms are respected and examine whether any past requests for temporary excesses, terms, etc, were made before rather than after the fact.

- If the company honors its obligations with creditors(legitimate disputes aside), as evidenced by a lack of writes, lawsuits, judgements,etc...

- If the management skills are sufficient for the size and scope of the business

- Does the management stay current on how to conduct business operations, introducing and uptading methods and technology when warranted?

- Is a reasonable business and financial plan in place, which does not depend on unrealistic levels of business growth or profitability improvement?

- If management is aware of monitors and complies with all relevant environmental regulations and practices

7.3.4. Industry Ratings Summary (Step 4)

This step recognizes the very important effect of an industry rating based on the type of industry and relative position of the borrower(i.e., their tier assessment) within their industry. Experience has shown that poorer-tier performers in weak, vulnerable industries are major contributors to credit losses.To do tis , the analyst needs to rate each industry type on, say, a scale of 1 to 5.

We can describe the industry rating in terms of competitiveness, trade environment, regulatory framework, restructuring, technological change, financial performance, long-term trends affecting demand, and vulnerability to macroeconomic environment.

Competitiveness; can be defined as the potential of the industry to sell its products in its domestic market and/or external markets, given its cost structure (determined by factors such as economies of scale, capital intensity, input costs, location, infrastructure and use of appropriate technology), international reputation, and effectiveness in targeting marketing niches.

Trade environment; All the institutional factors that affect inter-jurisdictional commerce in goods and services, including trade agreements that have an impact on the industry.

Regulatory framework; can be defined as the legal/institutional setting including laws and regulations of applicable levels of government direct and indirect taxation; grant programs; trade finance; and subsidies. One needs to take into account present policies and trends, the industry's ability to absorb and influence these policies and trends, and the impact of both supply and demand.

Technological change, can be defined as industry vulnerability to technological change that could result in changing costs; an alteration in the range of products or services of the industry; or an alteration in the range/price of competitive products/services.

Financial performance; can be defined as an assessment based on the present level, trends and sustainability of standard ratios such as return on equity, interest coverage, current ratio, debt/equity and debt/cash flow.

Long-term trends that affect demand include demographics (i.e., age structure, gender distribution, composition and wealth distribution of the relevant market); vintage of durables and infrastructure (age of fleet, age and conditions of roads, bridges) lifestyle changes and consumer attitudes.

Vulnerability to macroeconomic environment describes how sensitive the industry is economic downturns, fiscal policy, movements in interest rates and exchange rates, and other macroeconomic variables.

Tier Assessment, a business should be ranked against its relative competition. For example, if the company supplies a product/service that is subject to global competition then it should be ranked on a global basis. If the company's competitors are by nature local or regional, as are many retail businesses, then it should be ranked on that basis, while recognizing that competition may increase. If a business is local but has no local competitors, e.g., a local cable operator, then it should be ranked against such companies in other areas, with some recognition of the benefit of the exclusivity of its market (assuming that this is likely to continue)

Tier 1 players are major players with a dominant share of the relevant market (local, regional, domestic, international or niche). They have a diversified and growing customer base with low production costs that are based on sustainable factors (such as a diversified supplier base, economies of scale, location and resource availability, continuous upgrading of technology)

Such companies respond quickly and effectively to changes in the regulatory framework, trading environment, technology, demand patterns and macroeconomic environment.

Tier 2 players are important or above-average industry players with a meaningful share of the relevant market (local, regional, domestic, international or niche)

Tier 3 players are average (or modestly below average) industry players, with a moderate share of the relevant market.

Tier 4 players are weak industry players and have a declining customer base. They have a high cost of production due to factors such as low leverage with suppliers.

Financial Statement Quality, this step recognizes the importance of the quality of the financial information provided to the analyst.

Country Risk, country risk is the risk that a counterparty, or obligor, will not be able to pay its obligations because of cross-border restrictions on the convertibility or availability of a given currency. It is also an assessment of the political and economic of a country.

Third-party support, considerable care and caution are necessary if ratings are to be improved because of the presence of a guarantor. In all cases, one must be convinced that the third party/owner is committed to ongoing support of the obligor

Term, this step recognizes the increased risk associated with longer-term facilities and the lower risk of very short-term facilities

Structure, This step considers the effect of how strongly a facility is structured, its covenants, conditions, etc, in order to prompt appropriate adjustment(s) to the rating. The lending purposes and/or structure may influence (positively or negatively) the strength and quality of the credit. These may refer to the status of the borrower, the priority of the security, the covenants (or lack thereof) attached to a facility, etc.

For example, a facility that has been downgraded due to the term of a loan. If the structure contains very strong covenants which mitigate the effect of the term to maturity of the facility, it may be appropriate to make an adjustment to offset the effect of the term to maturity of the facility.

Collateral, the presence of security should heavily affect the severity of loss, given default, in any facility. The quality and depth of security varies widely and will determine the extent of the benefit in reducing any loss. If the business fails, what proceeds would be available? If the total security package includes components from various collateral categories, then one should generally use the worst category containing security on which any significant reliance is placed. The collateral category should reflect only the security held for the facility that is being rated.

- Pledged assets are of very high caliber and provide substantial over-coverage,
- A first charge is held over specific company assets or all company assets
- Background support may also add strength. (Personal Guarantees, etc..)

8 CREDIT ANALYSIS

The capacity which creates revenues, shows the repayment power of the debtor as a result of the commercial and industrial activities. In the long and medium term credits, the debt is used for the financment of the tangible assets, and the source of the repayment is the revenue created by these investments.

In opposition to the long and medium term credits , In the short term, the generation of cash play a critical role for the repayments.

Besides of the analysis of the financial datas of the companies by implementing different ratio calculations, the items which are mentioned below are very important.

- ❑ Business Process Diagram of The Credit customer,
- ❑ Business Experience,
- ❑ Duration in the sector,
- ❑ Market effectiveness,
- ❑ Demand to the product in the market,
- ❑ Competition level in the market,
- ❑ Using areas of the operating income.

Credit analysis focuses at determining credit risk for various financial and nonfinancial instruments as well as projects. Credit risk analysis can be separated into two steps. The first part consists of analysing the credit risk of a particular asset. Given the information in the first step, the second part analyses the risk of the whole portfolio which comprises the individual credit sensitive entities. And it is true that the measurement and management of credit risk has become a key risk-management issue for both financial and non-financial institutions. With the improved liquidity in credit derivative market and advances in modelling, the accurate measurement and management of credit risk to achieve the desired exposure is not as difficult as before.

Ratios were originally developed at the turn of twentieth century from credit relationships businesses had with each other and with lenders. Ratio analysis helps creditors evaluate a company's financial strengths and weakness, flagging any irregularities that may affect repayment of debt. Ratios don't tell the whole story; they offer clues, not direct answers. It is unreasonable to expect that the mechanical calculation of one ratio or a group ratios will automatically yield critical information about a complex corporation.

Ratios serve as relative measures or interactions between numbers. They are used to (1) clarify the relationship between accounts or items appearing on financial reports (structural analysis) , (2) match borrowers' performance against historical levels (time-series analysis) and (3) compare performance with benchmarks or industry averages (cross-sectional analysis)

Moreover, Ratio Analysis does have inherent problems and limitations that necessitate care and judgement. Some potential problems

1. Many large firms operate a number of different divisions in quite different industries, and in such cases it is difficult to develop a meaningful set of industry averages for comparative purposes. This tends to make ratio analysis more useful for small, narrowly focused firms than for large ones.
2. Most firms want to be better than average, so merely attaining average performance is not necessarily good. As a target for high-level performance, it is best to focus on the industry leaders' ratios.
3. Firms can employ "window dressing" techniques to make their financial statements look stronger. For example a firm borrows on a two year basis on december 29, 2005 held the proceeds of the loan as cash for few days, and then paid off the loan ahead of time on January 2, 2006. this improved his current and quick ratios, and made his year-end 2005 balance sheet look good. However, the improvement was strictly window dressing, a week later the balance sheet was back at the old level.
4. Different accounting practices can distort comparisons. As noted earlier, inventory valuation and depreciation methods can affect financial statements

and thus distort comparisons among firms. Also if one firm leases a substantial amount of its productive equipment, then its assets may appear low relative to sales, because leased assets often do not appear on the balance sheet.

8.1. Importance of Credit Analysis

In the past decade, regulators have been gaining familiarity and experiences in the monitoring of banks and other financial institutions in terms of solvency and capital adequacy. Some of the perverse effects of the Basle accord have been widely documented. With the arrival of the new Basle II accord around 2005 and other improvement in accounting, it is important for financial institutions to develop internal models to demonstrate the capability of risk management, including demonstrating the effectiveness of hedging which can result in freeing up of regulatory capital. Given the improvement in the regulatory regime, sound credit analysis, rather optimization according to arcane rules, are more relevant for the future. During 2001 and 2002, there have been very high profile cases of default, such as Enron and WorldCom with very large amount of outstanding debt. Some financial institutions have been caught unguarded with large amount of exposure. During the late 90's, banks have been pressured to lend money to gain business in other areas such as merger and acquisitions, resulting in large exposure of idiosyncratic credit risk to particular companies. The current prevalent practice of marking loans at par value regardless of the counter party's credit risk poses

significant problems in proper risk management. Therefore the correct credit analysis and accurate measurement of the amount of credit risk involved is very important in determining whether the extra benefit from other business can compensate. With the increasing usage of largely unfunded derivative transactions, such as swaps, it is increasingly important to assess the counter party risk, as well as the correlation between market risk and credit risk, as the collapse of the trading company Enron readily demonstrated.

8.2. Credit Analysis of a Particular Asset

The analysis of a particular asset is a relatively familiar notion. Rating agencies such as Fitch, Moody's and S&P provides credit rating on individual companies as well as particular issues of bonds of the companies. With the improvement of liquidity of credit derivatives such as credit default swaps,

More timely information on the market assessment of the creditworthiness of particular companies is available. For companies of which the credit derivative market or cash bond market is active, the evaluation for the credit risk of a reference entity is relatively simple. If liquid market instruments are not available, a detail structural analysis of the company's balance sheet as well as other accounting and market information, such as its equity prices (such as the case in the structural model by Robert Merton and KMV), is required to determine the credit worthiness of the entity.

8.3. Portfolio Credit Analysis

Having all the individual credit analysis information is only the first step for analysing a portfolio of credits. Defaults and credit events tend to happen in clusters around time as well as in industrial sector. The high number of defaults and credit downgrades of telecommunication companies from 2001 to 2002 is a testimony to this stylised observation. A number of models have been proposed to model the correlation:

- i. Credit Metrics, developed by RiskMetrics
- ii. CreditRisk+ by Credit Suisse Financial Products
- iii. Credit Portfolio View by McKinsey and Company

All these models take the credit analysis of the individual companies as inputs. These models impose some structure of dependency in defaults across companies. A popular approach is to use copula that essentially is a mathematical function that generates a joint distribution from individual default distributions. A second approach is to assume companies depend on common factors as well as idiosyncratic factors that are specific to the particular company. However, since default is a rare event, data for correlated defaults are even more difficult to observe. This can be a difficult hurdle when using these models. However, with improvement of liquidity in multi-asset credit derivatives such as basket default swaps, the correlation and other dependency information among credits can hopefully be inferred from the market, and effectively hedged using these instruments.

8.4. Measuring The Exposure

If the amount owed by a counter party is a fixed sum, the exposure is easy to define. However, in a lot of circumstances, the counter party exposure varies according to market conditions. This is especially the case for derivative transactions such as swaps. The counter party is more likely to default when market condition moves adversely. To take into account the correlation of credit exposure and market movement, we need to model the market risk as well as credit risk jointly. This is in sharp contrast to the traditional approach and remains a challenge to risk management in volatile markets. To model this, in general we need sophisticated models across different asset markets so that the exposure can be obtained by simulation under different scenarios.

The good news is that there is an active market for credit risk as well as market risk, so that the individual components can be hedged effectively. However, the joint movement risk remains difficult, if not impossible to lay off, and awaits future innovation in the derivative industry. Entry category: credit risk management

Scope: financial statement analysis, ratio analysis, models for ratio analysis, e.g. credit scoring, default prediction (Altman model, etc),

8.5. Liquidity Ratios

Liquidity ratios measure the quality and capability of current assets to meet maturing short-term obligations as they come due. Acceptable liquidity levels depend on economic and industry conditions.

□ Current Ratio

The division of Current Assets to Current Liabilities, this ratio is a commonly used measure of short-term solvency and debt service.

□ Quick Ratio(Acid Test)

A more conservative liquidity measure the quick ratio depicts the borrower's short-term repayment ability. This ratio is generally considered to be a more accurate assessment of liquidity than the current ratio since inventory reliance is lower.³⁴

8.6. Leverage Ratios

□ Debt to Equity and Debt to Total Assets

Financial leverage, use of debt financing, has three important implications

1. By raising funds through debt, stockholder ownership is not diluted
2. Creditors look to the equity, or owner-supplied funds, to provide a margin of safety; if the stockholders have provided only a small proportion of the total financing, the risks of the enterprise are borne mainly by its creditors.
3. If the firm earns more on investments financed with borrowed funds than it pays in interest, the return on the owners' capital is leveraged.

³⁴ J.Fred Weston, Scott Besley, Eugene F. Brigham, **Essentials of Managerial Finance**, Eleventh Edition, Orlando: Dryden Press, 1996, , p.95,96.

Financial leverage affects the expected rate of return realized by stockholders for two reason:

1. The interest on debt is tax deductible while dividends are not, so paying interest lowers the firm's tax bill
2. The rate a firm earns from its investments in assets is different from the rate at which it borrows. If the firm has healthy operations, it generally invest the funds it raises at a rate of return that is greater than the interest rate on its debt.

Financial leverage is two-edged sword, when the firm experiences poor business conditions, typically sales are lower and costs are higher than the expected, but the cost of borrowing still must be paid. Therefore, the required interest payments might be a very significant burden for a firm that has liquidity problems. The firms with relatively high debt ratios have higher expected returns when the business is normal or good, but they are exposed to risk of loss when the business is poor.

Debt ratio is the ratio of total debt to total assets, measures the percentage of the firm's assets financed by creditors(borrowing). Total debt includes both current liabilities and long-term debt. Creditors prefer low debt ratios, because the lower ratio, the greater the cushion against creditors' losses in the event of liquidation.

8.7. Financial Distress

Over the years, researchers have studied the factors that cause firms to fail. The general consensus is that one leading cause of failure is management incompetence- specifically, inexperience in dealing with industry demand/supply factors or new developments combined with a poor strategic approach to R&D planning, sales, finance, production, research and cost containment.

In addition to management incompetence, the origins of many financial problems are infused in the fundamental changes that have occurred in an obligor's business, marketplace, economy, or industry months or even years prior to failure.

The QUANTITATIVE ANALYSIS of financial distress generally involves two statistical methods: regression and discriminant analysis. These methods are employed in predictive distress models. regression analysis uses past data to forecast future values of dependent variables, while discriminant analysis produces an index that allows an observation to be classified into one of several a priori groupings.³⁵

The fabric of the model lies in the predictive power of what I call the domino-multiplier syndrome and the asset management syndrome. The domino-multiplier syndrome holds for high (operating) leverage firms engaged in the production of goods. A high degree of operating leverage implies that a relatively small change in sales results in a large change in net operating income. Firms borrowing to expand their fixed asset base run the risk of not being able to cover fixed overhead if sales unexpectedly drop.

³⁵ Morton Glantz, **Managing Bank Risk**, First Edition, Boston: Academic Press, 2003, p.299,300,301,302.

9 RATING SYSTEM BASED ON SECTOR PERCENTILES AND Z SCORES

The rating companies such as Standard & Poors, Moodys, CSFB, uses Altman-Z model as a reference for their scoring system. According to the scoring system which was built, the default probability of the firms can be forecasted in advance. This rating system based on the two aspects. Firstly, comparing some financial ratios with the ratios of the production sector divided into percentiles which are published by TCMB. Secondly calculating the Altman Z Score original version and additionally the Altman Z'' Score new version which was developed by Dr.Edward I. Altman in 1990's, by using the financial ratios of the example firms.

Table 6 Percentiles Aspect

	1992 SQ	1992 Q	1992 Q1	1992 Q2	1992 Q3
Liquidity					
<i>Current Ratio</i>	1.21418	1.4603237	1.0552	1.2114	1.7587

SQ. value is the ratio calculated by the sector financial table, created by TCMB.

Q , value is the average ratio of the firms in the sample used by TCMB.

Q1 , is the value that 25% of the firms in the sample used by TCMB has equal or below ratio value from it.

Q2 , is the value that 50% of the firms in the sample used by TCMB has equal or below ratio value from it.

Q3 , is the value that 75% of the firms in the sample used by TCMB has equal or below ratio value from it.

Table 7 Percentiles Formulation

	1992 SQ	1992 (SQ+Q1)/2	1992 Q1	1992 (Q1+Q2)/2	1992 Q2	1992 (Q2+Q3)/2	1992 Q3
Liquidity							
<i>Current Ratio</i>	121%	113%	106%	113%	121%	149%	176%

If the firm's ratio is higher or equal than or to the Q1 value, therefore the firm takes a 'AAA' rating for this ratio.

If the firm's ratio is higher or equal than or to the value of $(Q2+Q3)/2$ and lower than the value of Q3, therefore the firm takes a 'AA' rating for this ratio.

If the firm's ratio is higher or equal than or to the value of Q2 and lower than the value of $(Q2+Q3)/2$, therefore the firm takes a 'A' rating for this ratio.

If the firm's ratio is higher or equal than or to the value of $(Q1+Q2)/2$ and lower than the value of Q2, therefore the firm takes a 'BBB' rating for this ratio.

If the firm's ratio is higher or equal than or to the value of Q1 and lower than the value of $(Q1+Q2)/2$, therefore the firm takes a 'BB' rating for this ratio.

If the firm's ratio is higher or equal than or to the value of $(SQ+Q1)/2$ and lower than the value of Q1, therefore the firm takes a 'B' rating for this ratio.

If the firm's ratio is lower than the value of $(SQ+Q1)/2$, therefore the firm takes a 'C' rating for this ratio.

Table 8 Standard and Poors Ratings Category Definitions³⁶

AAA	The highest rating assigned by S&P. The obligor's capacity to meet its financial commitment on the obligation is extremely strong.
AA	The obligor's capacity to meet its financial commitment on the obligation is very strong.
A	An obligation rated A is somewhat more susceptible to the adverse effects of changes in circumstances and economic conditions than obligations in higher rated categories. However, the obligor's capacity to meet its financial commitment on the obligation is still strong.
BBB	An obligation rated BBB exhibits adequate protection parameters. However adverse economic conditions or changing circumstances are more likely to lead to a weakened capacity of the obligor to meet its financial commitment on the obligation.

³⁶ Bluhm Christian, Overbeck Ludger, Wagner Christoph, 2003, p.19,20.

BB	An obligation rated BB is less vulnerable to nonpayment than other speculative issues. However, it faces major ongoing uncertainties or exposure to adverse business, financial, or economic conditions which could lead to the obligor's inadequate capacity to meet its financial commitment on the obligation.
B	An obligation rated BB is less vulnerable to nonpayment than obligations rated BB but the obligor currently has the capacity to meet its financial commitment on the obligation. Adverse business, financial, or economic conditions will likely impair the obligor's capacity or willingness to meet its financial commitment on the obligation.
CCC	An obligation rated CCC is currently vulnerable to nonpayment and is dependent upon favorable business, financial, or economic conditions for the obligor to meet its financial commitment on the obligation. In the event of adverse business, financial and economic conditions, the obligor is not likely to have the capacity to meet its financial commitment on the obligation.
CC	An obligation rated CC is currently highly vulnerable to nonpayment
C	The C rating may be used to cover a situation where a bankruptcy petition has been filed or similar action has been taken, but payments on this obligation are being continued.
D	The D rating, unlike other ratings, is not prospective; rather, it is used only where a default has actually occurred.

Z SCORES ASPECT

Z Score (Original Version)

Here is the formula (for manufacturing firms), which is built out of the five weighted financial ratios:

$$Z = 1.2A + 1.4B + 3.3C + 0.6D + 0.999E$$

Where:

A = Working Capital/Total Assets

B = Retained Earnings/Total Assets

C = Earnings Before Interest & Tax/Total Assets

D = Market Value of Equity/Total Liabilities

E = Sales/Total Assets

Z > 2.99 : classified as financially sound

Z < 1.81 : classified as financially distressed or bankrupt

Between 1.81 and 2.99 , it is neutral.

Z'' Score

Here is the formula (for manufacturing firms), which is built out of the five weighted financial ratios:

$$Z = 6.72A + 1.05B + 6.56C + 3.26D$$

Where:

A = EBIT/Total Assets

B = Equity/Total Liabilities

C = Working Capital/Total Assets

D = Retained Earnings/ Total Assets

Z > 2.6 classified as financially sound

Z < 1.1 : classified as financially distressed or bankrupt

Between 1.1 and 2.6 , it is neutral.

9.1. Consolidation of Two Approach

For the consolidation of two approach, firstly I numbered all the rating from AAA to D, secondly I determined the multipliers of each ratio. For example, the multiplier for the current ratio is 0.075, for the net profit margin is 0.025. The detailed explanation about this issue can be found in the ratios.

In this rating system, Z Score also produces ratings;

Z" Score

If the firm's Z Score is higher or equal than 2.6, therefore the firm takes a 'AAA' rating.

If the firm's Z Score is less than 1.1, therefore the firm takes a 'C' rating.

If the firm's Z Score is less than 2.6 AND higher than 1.1 therefore the firm takes a 'BBB' rating.

The weight of each approach is 50% so the sum of the each rating creates final rating of the firm. For example; In 1992, Arçelik Company has 3.33 points from the comparison with sector percentiles and 3.5 points from Z" Score ,1.05 points from Original Z score ,therefore the final rating is "3.33+3.5+1.05= 7.88" This value match with the rating 'A'.

Table 9 Calculation For The Company "ARÇELİK"

		AAA	AA	A	BBB	BB	B	CCC	CC	C	D
		10	9	8	7	6	5	4	3	2	1

		AAA	AA	A	BBB	BB	B	CCC	CC	C	D
Liquidity											
Current Ratio	0.075	0.75	0.68	0.60	0.53	0.45	0.38	0.30	0.23	0.15	0.08
Working Capital Leverage Ratio	0.025	0.25	0.23	0.20	0.18	0.15	0.13	0.10	0.08	0.05	0.03
Acid Test Ratio	0.075	0.75	0.68	0.60	0.53	0.45	0.38	0.30	0.23	0.15	0.08
Solvency-Ability To meet key term obligations											
Interest Coverage	0.040	0.40	0.36	0.32	0.28	0.24	0.20	0.16	0.12	0.08	0.04
Leverage and Capital Measure											
Debt to Assets	0.050	0.50	0.45	0.40	0.35	0.30	0.25	0.20	0.15	0.10	0.05
Long Term Debt to Assets	0.025	0.25	0.23	0.20	0.18	0.15	0.13	0.10	0.08	0.05	0.03
Profitability											
Return On Assets	0.040	0.40	0.36	0.32	0.28	0.24	0.20	0.16	0.12	0.08	0.04
Return On Equity	0.040	0.40	0.36	0.32	0.28	0.24	0.20	0.16	0.12	0.08	0.04
EBIT/Assets	0.025	0.25	0.23	0.20	0.18	0.15	0.13	0.10	0.08	0.05	0.03
Retained Earnings/Assets	0.025	0.25	0.23	0.20	0.18	0.15	0.13	0.10	0.08	0.05	0.03
Net Worth/Liabilities	0.025	0.25	0.23	0.20	0.18	0.15	0.13	0.10	0.08	0.05	0.03
Gross Product Margin	0.025	0.25	0.23	0.20	0.18	0.15	0.13	0.10	0.08	0.05	0.03
Net Profit Margin	0.025	0.25	0.23	0.20	0.18	0.15	0.13	0.10	0.08	0.05	0.03
	0.50										
		AAA	AA	A	BBB	BB	B	CCC	CC	C	D
ALTMAN Z"-Score	0.35	3.50	3.15	2.80	2.45	2.10	1.75	1.40	1.05	0.70	0.35
ALTMAN Z-Score	0.15	1.50	1.35	1.20	1.05	0.90	0.75	0.60	0.45	0.30	0.15
	0.50										

From one country to another, the business environment, management culture, some accounting standarts changes but the operations of the companies doesn't change. The logic is simple, the main objective of a firm is to make profit from its business operations. During these operations, the company uses credit, some portion of sales of service or products are realized by cash, the rest of the sales is realized by cheques, bill of exchange or open account. The company accept to take its receivables with some maturity. On the other side for the purchases of raw materials and services, the company uses cash and other instruments which permit to the company to pay with some maturity. The balance of these items give us an opinion about the company.

Standard & Poors, Moodys, CSFB uses a very huge archive of defaulted companies and match the datas of these companies with the financial ratios. In Turkey, the financial institutions doesn't have reliable datas to use for the calculation of default probabilities in the structuring of credit risk models. Small sample sizes can not be a enough data pool to use statistical techniques. Therefore the other institutions which doesn't have an archive, uses these datas in order to map the companies in their portpolio.

Credit risk or default risk involves inability or unwillingness of a customer or counterparty to meet commitments in ralation to lending and other operations. The credit risk

of a financial institution's portfolio depends on both external and internal factors. The external factors are the state of the economy, wide swings in commodity/equity prices, foreign exchange rates and interest rates, trade restrictions, economic sanctions, government policies. The internal factors are deficiencies in loan policies administrations, absence of predetermined credit limits, inadequately defined lending limits, deficiencies in credit analysis process, inadequate risk pricing, absence of loan review mechanism and monitoring debtors.

Measurement of credit risk through rating and scoring system may be a valuable indicator for the credit policy. I arranged a rating system to show that the default of a firm is not a sudden event, but an event caused by some effects in time horizon and the financial institutions have the opportunity to understand these effects and take the necessary precautions.

Unfortunately, a best rating system also can not give an appropriate rating as an experienced and skilled credit analyst. Since there are a lot of factors which impact the rating of a company. And these factors are correlated each other. For this reason rating institutions such as Standard & Poors, Moodys credit analyst calibrate the ratings which are taken by their rating system. The credit analyst approve the ratings according their final decision about the company.

9.2. Financial Ratios Used In The Rating System

For this rating system, I used 12 financial ratios. Some of these ratios are used by Altman Z Score, Shumway Score and Standart & Poors, Moodys rating systems.

9.2.1. Liquidity Ratios

$$\text{Current Ratio} = \frac{\text{Current Assets}}{\text{Current Liabilities}}$$

(Multiplier : 0.075)

$$\text{Acid Test Ratio (Quick Ratio)} = \frac{\text{Current Assets}-\text{Inventory}}{\text{Current Liabilities}}$$

(Multiplier : 0.075)

Liquidity is a common variable in most credit decisions – a fact that is brought to mind by the adage that a bank will only lend you money when you don't need it. If you have sufficient current assets, you can pay current liabilities, but neither do you need working capital. Liquidity is also an obvious contemporaneous measure of default, since, if a firm is in default, its current ratio must be low.

The first point to note is that the ratio of short-term to long-term debt appears of little use in forecasting. This is of even less relevance for private firms, as banks often put loans with functionally multiyear maturities into 364-day facilities for regulatory purposes. Banks have different regulatory capital requirements for 364-day facilities versus those that are above 364 days, which creates a tendency to put what are ostensibly longer-term commitments into one of these shorter-term categories even though its practical maturity is much longer.

Second, the Quick Ratio appears slightly more powerful than the ratio of working capital/total assets (a variable used in Altman's Z Score). Third, the current ratio shows a more linear relation to default, but the basic trendline is, on average, not significantly different than the quick ratio. The quick ratio is simply the current ratio, excepting one removes inventories from current assets. Thus the quick ratio is a leaner version of the current ratio that excludes relatively illiquid current assets.

Ordinarily, a firm experiencing consistent operating losses will have shrinking current assets in relation to total assets. Of the three liquidity ratios evaluated, this one proved to be most valuable. Two other liquidity ratios tested were the current ratio and the quick ratio. There were found to be less helpful and subject to perverse trends for some failing firms.

$$\text{Working Capital Leverage Ratio} = \frac{\text{Working Capital}}{\text{Assets}}$$

(Multiplier : 0.025)

The working capital/total assets ratio measures the net liquid assets of the firm relative to the total capitalization. Working capital is defined as the difference between current assets and current liabilities. Liquidity and size characteristics are explicitly considered.

9.2.2. Solvency-Ability To Meet Key Term Obligations

$$\text{EBIT Interest Coverage} = \frac{\text{Earnings from operations before interest and taxes}}{\text{Gross Interest incurred before Subtracting Capitalized Interest and Interest Income}}$$

(Multiplier : 0.040)

The interest coverage ratio is a measurement of the number of times a company could make its interest payments with its earnings before interest and taxes; the lower the ratio, the higher the company's debt burden.

Interest coverage is the equivalent of a person taking the combined interest expense from their mortgage, credit cards, auto and education loans, and calculating the number of times they can pay it with their annual pre-tax income. For bond holders, the interest coverage ratio is supposed to act as a safety gauge. It gives you a sense of how far a company's earnings can fall before it will start defaulting on its bond payments. For stockholders, the interest coverage ratio is important because it gives a clear picture of the short-term financial health of a business.

To calculate the interest coverage ratio, divide EBIT (earnings before interest and taxes) by the total interest expense.

As a general rule of thumb, investors should not own a stock that has an interest coverage ratio under 1.5. An interest coverage ratio below 1.0 indicates the business is having difficulties generating the cash necessary to pay its interest obligations. The history and consistency of earnings is tremendously important. The more consistent a company's earnings, the lower the interest coverage ratio can be.

EBIT has its short fallings; companies do pay taxes, therefore it is misleading to act as if they didn't. A wise and conservative investor would simply take the company's earnings before interest and divide it by the interest expense. This would provide a more accurate picture of safety.

Because interest coverage is a highly variable measure, not only between companies within an industry but between different industries, it is worthwhile to establish some guidelines for setting acceptable levels of interest coverage in particular industries. Obviously, an interest-coverage ratio below 1 is an immediate indication that the company, regardless of its industry, is not generating sufficient cash to cover its interest payments. That said, an interest-coverage ratio of 1.5 is generally considered the bare minimum level of comfort.

Beyond these absolute minimums, determining an acceptable interest coverage for an industry depends on its nature - or more specifically, the stability or consistency of its earnings. Improving interest coverage is a positive signal of the company's overall health, and a declining pattern is a danger sign of a financial difficulty, which may be imminent or far off into the future. However, a declining ratio does not automatically mean death for the company, since a temporary change in operations can result in a blip in earnings.

9.2.3. Leverage Ratios & Capital Measure

In addition to profitability, leverage is a key measure of firm risk. The higher the leverage, or gearing, the smaller the cushion for adverse shocks.

$$\text{Debt to Assets Ratio} = \frac{\text{Current Liabilities} + \text{Long Term Liabilities}}{\text{Total Assets}}$$

(Multiplier : 0.050)

$$\text{LT Debt to Assets Ratio} = \frac{\text{Long Term Liabilities}}{\text{Total Assets}}$$

(Multiplier : 0.025)

A ratio under 1 means a majority of assets are financed through equity, above 1 means they are financed more by debt. Furthermore you can interpret a high ratio as a "highly debt leveraged firm".

The ratio is calculated by dividing the total external liabilities by total assets owned by the company. This ratio is an indication of the extent to which assets are financed by debt. A lower debt asset ratio would mean that a large part of the assets is financed by shareholders' funds and hence the risk would be lower.

Lower debt assets ratio would also mean lower percentage returns on equity capital. The company would have to maintain higher margins to earn a decent return on the large amount of shareholders' funds employed in the business.

9.2.4. Profitability Ratios

Return On Assets

$$\text{Return On Assets (ROA)} = \frac{\text{Net Income}}{\text{Total Assets}}$$

(Multiplier : 0.040)

Where asset turnover tells an investor the total sales for each \$1 of assets, return on assets [or ROA for short] tells an investor how much profit a company generated for each \$1 in assets. The return on assets figure is also a sure-fire way to gauge the asset intensity of a business. Companies such as telecommunication providers, car manufacturers, and railroads are very asset-intensive, meaning they require big, expensive machinery or equipment to generate a profit. Advertising agencies and software companies, on the other hand, are generally very asset-light (in the case of a software companies, once a program has been developed, employees simply copy it to a five-cent disk, throw an instruction manual in the box, and mail it out to stores).

Return on assets measures a company's earnings in relation to all of the resources it had at its disposal [the shareholders' capital plus short and long-term borrowed funds]. Thus, it is the most stringent and excessive test of return to shareholders. If a company has no debt, the return on assets and return on equity figures will be the same.

There are two acceptable ways to calculate return on assets.

The lower the profit per dollar of assets, the more asset-intensive a business is. The higher the profit per dollar of assets, the less asset-intensive a business is. All things being equal, the more asset-intensive a business, the more money must be reinvested into it to continue generating earnings. This is a bad thing. If a company has a ROA of 20%, it means that the company earned \$0.20 for each \$1 in assets. As a general rule, anything below 5% is very asset-heavy [manufacturing, railroads], anything above 20% is asset-light [advertising firms, software companies].

Return On Equity

$$\text{Return On Equity (ROE)} = \frac{\text{Net Income}}{\text{Shareholder's Equity}}$$

(Multiplier : 0.040)

Sometimes ROE is referred to as Stockholder's return on investment, it tells the rate that shareholders are earning on their shares. Cory's Tequila Co. is earning a very respectable 18% on shareholder's equity. But ROE is often misunderstood, for example if the return on equity is 10% then ten cents of assets are created for each dollar that was originally invested. Companies that generate high returns relative to their shareholder's equity are companies that pay their shareholders off handsomely, creating substantial assets for each dollar invested. These businesses are more than likely self-funding companies that require no additional debt or equity investments.

EBIT/Assets

Higher profitability should raise a firm's equity value. It also implies a longer way for revenues to fall or costs to rise before losses occur.

$$\text{EBIT /Assets} = \frac{\text{Earnings from operations before interest and taxes}}{\text{Total Assets}}$$

(Multiplier : 0.025)

Retained Earnings/Assets Ratio

The Capital-turnover ratio is a standard financial ratio illustrating the sales generating ability of the firm's assets. It's one measure of management's capacity to deal with competitive conditions.

$$\frac{\text{Retained Earnings}}{\text{Total Assets}}$$

(Multiplier : 0.025)

Retained Earnings is the account which reports the total amount of reinvested earnings and/or losses of a firm over its entire life. The account is also referred to as earned surplus. The RE/TA ratio measures the leverage of a firm. Those firms with high RE, relative to TA, have financed their assets through retention of profits and have not utilized as much debt.

Retained earnings is the total amount of reinvested earnings and/or losses of a firm over its entire life. The age of a firm is implicitly considered in this ratio: a relatively young firm, for example, will probably show a low RE/TA because it has not had time to build up its cumulative profits. It may therefore be argued that this analysis discriminates against the young firm.

9.3. Scenario A

The financial statements were analysed in four aspects.

- I. Liquidity
- II. Ability to meet key term obligations
- III. Leverage
- IV. Profitability

The aim of Scenario A is to explore the effects of a change in the weights of these aspects on the calculation table. Interest coverage ratio is an important data to predict an early signal of financial distress. A firm with a weak interest coverage ratio, may suffer serious cash flow problems in the medium term. So an increase in the weight of this ratio may increase the reliability of the scoring system.

Table 10 Differences Between Original Version and Scenario A

	Org.	Scnr. A	Change
Liquidity			
<i>Current Ratio</i>	0.075	0.010	Decreased
<i>Working Capital Leverage Ratio</i>	0.025	0.010	Decreased
<i>Acid Test Ratio</i>	0.075	0.010	Decreased
Solvency-Ability To meet key term obligations			
<i>Interest Coverage</i>	0.040	0.170	Increased
Leverage and Capital Measure			
<i>Debt to Assets</i>	0.050	0.025	Decreased
<i>Long Term Debt to Assets</i>	0.025	0.020	Decreased
Profitability			
<i>Return On Assets</i>	0.040	0.100	Increased
<i>Return On Equity</i>	0.040	0.025	Decreased
<i>EBIT/Assets</i>	0.025	0.025	-
<i>Retained Earnings/Assets</i>	0.025	0.025	-
<i>Net Worth/Liabilities</i>	0.025	0.025	-
<i>Gross Product Margin</i>	0.025	0.025	-
<i>Net Profit Margin</i>	0.025	0.025	-

As seen on the Table 10, the liquidity aspect's weight is decreased and the solvency ability and profitability aspect's weight increased. The aim of "Scenario A" is to explore the

effects of a change in the weights of the “Current Ratio” (decreased from 0.075 to 0.01), “Working Capital Leverage Ratio” (decreased from 0.025 to 0.01), “Acid Test Ratio” (decreased from 0.075 to 0.010), “Interest Coverage Ratio” (increased from 0.040 to 0.17), “Debt to Assets Ratio” (decreased from 0.050 to 0.025), “Long Term Debt to Assets Ratio” (decreased from 0.025 to 0.02) “Return on Assets Ratio” (increased from 0.04 to 0.1) and “Return on Equity Ratio” (decreased from 0.04 to 0.025) on the ratings produced by score card. Scenario A based on the assumption that the interest coverage ability and profitability are more important indicators than liquidity and solvency-ability to reflect the financial healthy of a firm. Why? If the conditions allow all the firms try to increase their production by investing. But Investment requires capital ; These investments can be financed with firm’s equity or with loans. If a firm uses credit , it accepts to pay interest. As a result, the interest is the price that the firm pay for a sustainable growth. But, the main issue is the balance between the value of economical gains of the growth and the interest amount paid. A weak Interest coverage ratio relatively to the market, show that the firm can not generate enough revenue against the credits used.

As a result of my analysis of “Arçelik” score cards derivated from original calculation table and “Scenario A” calculation table; It observed that the ratings were not changed generally, except for the year 1994 and 1995. Rating of Arçelik is “AA” for the year 1994 and 1995 according to the original score card, then “A” according to the “Scenario A” score card. The 94 crisis can be the reason of this decline in the rating, since during the crisis, the interest rates increased dramatically, as a result, firm’s (with high leverage) financial expenditures increased.

Table 11 Ratings of “Arçelik” Based on Two Approaches

Years	Org.	Scnr. A	Change
1992	A	A	-
1993	A	A	-
1994	AA	A	Decreased
1995	AA	A	Decreased
1996	AA	AA	-
1997	AA	AA	-
1998	A	A	-
1999	A	A	-
2000	A	A	-
2001	A	A	-
2002	A	AA	Increased

As a result of my analysis of “Berdan Teks.” score cards derivated from original calculation table and “Scenario A” calculation table; It observed nine changes which can be seen on Table 12. Even if the rating based on “Scenario A”, reflects the effect of the crise which was occured in 1994 (Rating “A” of the original calculation was replaced by “BBB”) it failed for the years 1995,1996,1997,1998,1999. Since ratings, based on “Scenario A” score card, are higher than the “Original” score card, before the default year of the firm in 2000. The increase on the weights of the ratios ; “Interest Coverage”, “Return on Assets”, “Return on Equity”, did not increase the realiability of the score card.

Table 12 Ratings of “Berdan Teks.” Based on Two Approaches

Years	Org.	Scnr. A	Change
1992	BBB	BBB	-
1993	BB	BB	-
1994	A	BBB	Decreased
1995	A	AA	Increased
1996	A	AA	Increased
1997	BB	BBB	Increased
1998	CCC	B	Increased
1999	CC	CCC	Increased
2000	CCC	CC	Decreased
2001	CCC	CC	Decreased
2002	CCC	CC	Decreased

9.4. Scenario B

The aim of Scenario B is to explore the effects of a change in the weights of the “Current Ratio” (increased from 0,075 to 0,090), “Interest Coverage Ratio” (decreased from 0,040 to 0,030), “Debt to Assets Ratio” (increased from 0,050 to 0,075), “Return on Assets Ratio” (decreased from 0,040 to 0,025), “Return on Equity Ratio” (decreased from 0,040 to 0,025), “Net Profit Margin” (increased from 0,025 to 0,030), on the ratings produced by score card. Scenario B based on the idea that the liquidity and leverage level are more important than the solvency-ability and profitability. The reason of the low increase in the weight of net profit margin is to balance the score card. Current Ratio is an important data to predict an early signal of financial distress. A firm with a weak current ratio, may suffer serious cash flow problems in the medium term. So, an increase in the weight of this ratio may increase the reliability of the scoring sytem. According to Scenario A, Interest coverage ratio may be

misleading to detect a signal of default. So, a decrease in the weight of this ratio may increase the reliability of the scoring system.

Table 13 Differences Between Original Version and Scenario B

	Org.	Scnr. B	Change
Liquidity			
<i>Current Ratio</i>	0.075	0.090	Increased
<i>Working Capital Leverage Ratio</i>	0.025	0.025	-
<i>Acid Test Ratio</i>	0.075	0.075	-
Solvency-Ability To meet key term obligations			
<i>Interest Coverage</i>	0.040	0.030	Decreased
Leverage and Capital Measure			
<i>Debt to Assets</i>	0.050	0.075	Increased
<i>Long Term Debt to Assets</i>	0.025	0.025	-
Profitability			
<i>Return On Assets</i>	0.040	0.025	Decreased
<i>Return On Equity</i>	0.040	0.025	Decreased
<i>EBIT/Assets</i>	0.025	0.025	-
<i>Retained Earnings/Assets</i>	0.025	0.025	-
<i>Net Worth/Liabilities</i>	0.025	0.025	-
<i>Gross Product Margin</i>	0.025	0.025	-
<i>Net Profit Margin</i>	0.025	0.030	Increased

As a result of my analysis of “Arçelik” score cards derivated from original calculation table and scenario I calculation table; the ratings were not changed generally, except for the year 1997. Rating of Arçelik is “AA” for the year 1997 according to the original score card, then “A” according to the Scenario B score card.

Table 14 Ratings of “Arçelik” Based on Two Approaches

Years	Org.	Scnr. B	Change
1992	A	A	-
1993	A	A	-
1994	AA	AA	-
1995	AA	AA	-
1996	AA	AA	-
1997	AA	A	Decreased
1998	A	A	-
1999	A	A	-
2000	A	A	-
2001	A	A	-
2002	A	A	-

As a result of my analysis of “Berdan Teks.” score cards derivated from original calculation table and scenario B calculation table; the ratings were not changed generally, except for the year 1999. Rating of “Berdan Teks.” is “CC” for the year 1999 according to the original score card, then “CCC” according to the Scenario B score card.

Table 15 Ratings of “Berdan Teks.” Based on Two Approaches

Years	Org.	Scnr. B	Change
1992	BBB	BBB	-
1993	BB	BB	-
1994	A	A	-
1995	A	A	-
1996	A	A	-
1997	BB	BB	-
1998	CCC	CCC	-
1999	CC	CCC	Increased
2000	CCC	CCC	-
2001	CCC	CCC	-
2002	CCC	CCC	-

9.5. Rated Firms

1. ARÇELİK

Arçelik is one of the biggest white goods producer of Turkey. The products include white goods, electronic goods, heaters, air conditioners, vacuum cleaners, small home appliances, and built-in products. The Company is the market leader in Turkey and exports over 27% of its production mainly to the United States, Europe, the Middle East and North Africa.

According to the rating system created, the rating of this firm is rated as 'A' and 'AA' for 11 years. We can see in the graphic that the Altman Z" Score also support this rating. As a result, the firm has a very strong financial data and the possibility of a financial distress is minimum.

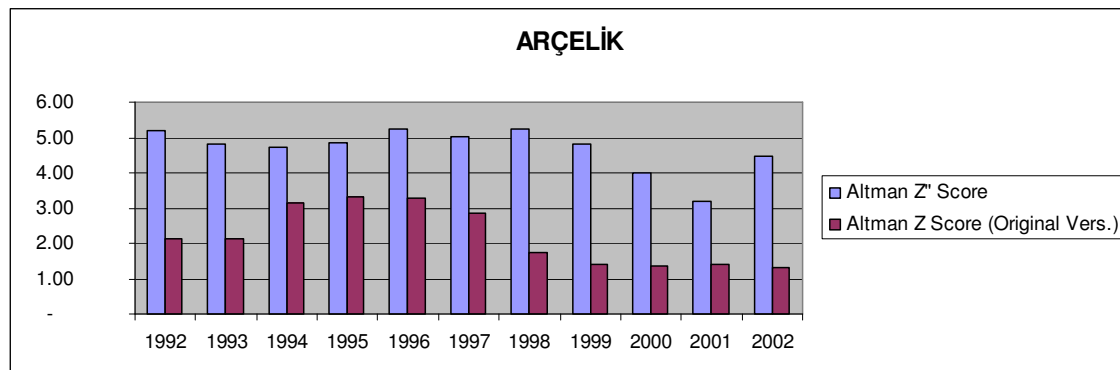


Figure 16 Z-Score Graph of "ARÇELİK"

2. BANVİT

Starting as a feed producer in 1968, Banvit gradually went into the production of broiler chickens. Today, the Company is able to carry out all stages of vertical integration regarding poultry production. It owns the largest broiler chicken processing facility under a single roof able to process 16.000 birds per hour and 75 million per year.³⁷ This capacity is

³⁷ Banvit, Retrieved: May 5,2006 from URL: <http://www.banvit.com/English/KurumsalDundenBugune.aspx>

equal to the figures from economies of scale at leading poultry producers around the world. As a result of restructuring that began in 1996, Banvit extended its vision and focused on investments that would lead it toward becoming one of the foremost food producers in Europe.

According to the rating system created, the firm is rated as AA in 1992,1993,1994,1995,1997, 1998 and as 'A' for the years 1999, 2000. But in 2001 the rating became 'CCC' since the net profit margin realized as -8%. The decrease in the revenues is evaluated a signal of a financial distress. We can see in the graphic that the Altman Z Score also support this situation. As a result, the firm has strong financial datas until the year 2000. But after 2001 the possibility of a financial distress increased.

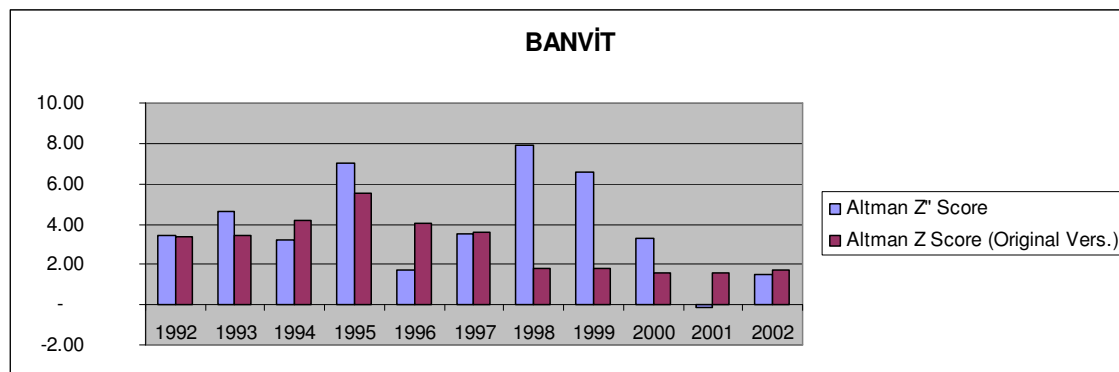


Figure 17 Z-Score Graph of "BANVİT"

3. BERDAN TEKS

Berdan Tekstil was established in 1951, the firm aims to be among the top international producers of fashionable fabric blends designed for the high-end of the women's and men's outerwear market and the best in terms of quality and service. The company ranks among the top 500 manufacturing companies in Turkey with its annual capacity 16 million meters and gross sales €60 million which has made Berdan become a valued partner of ready-to-wear manufacturers in Turkey, Europe and North America.³⁸

³⁸ Berdan, Retrieved: May 5,2006 from URL: <http://www.berdan.com.tr/berdan.htm>

According to the rating system created, the firm showed a medium financial performance and for the year 2000, the rating is calculated as 'CCC'. Therefore, it was taken to the "İSTANBUL YAKLAŞIMI" for the restructuring of its debts to financial institutions. We can see in the graphic that the Altman Z Score also support this situation. As a result, the firm has strong financial data until the year 1996. But after 1998, the possibility of a financial distress increased. Until the year 2000, two versions of Z score are parallel. But for the years 2001 and 2002 the financial distress possibility is very high according to Z score.

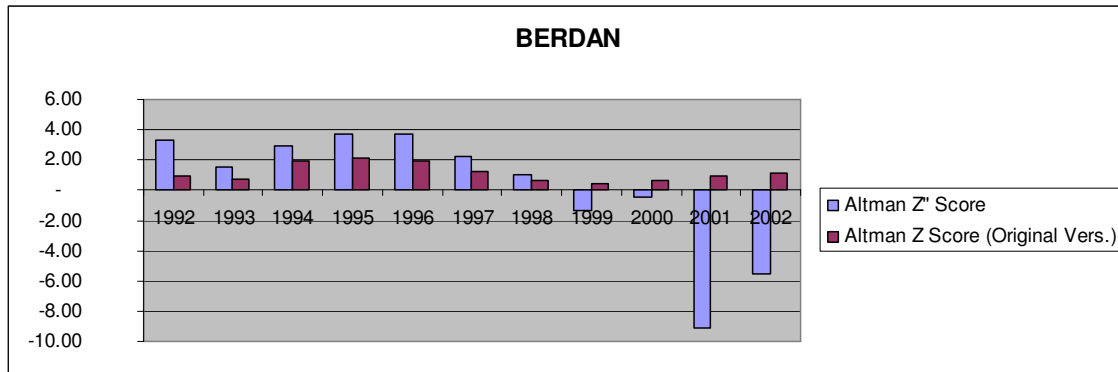


Figure 18 Z-Score Graph of "BERDAN"

4. ÇBS

ÇBS was established in 1943. The firm deals with the production of paint to the construction and automotive sector.

As we see, in the Credit Rating Analysis Table, the rating is calculated as 'CC' for the years 1995, 1997 and as 'CCC' for the years 1998, 1999, 2000, 2001. We can see in the graphic that the Altman Z Score, the firm doesn't have a strong financial data and the possibility of a financial distress is high.

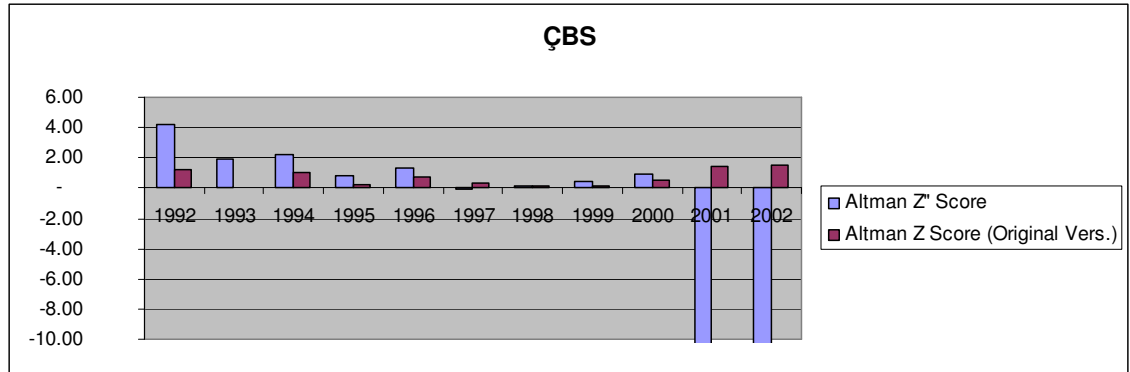


Figure 19 Z-Score Graph of "ÇBS"

5. DARDANEL

Dardanel was established in 1984 and deals with the production of canned tuna and other canned fish, fish flour, frozen sea food, cat and dog food. The production capacity of the firm is 60,000 tons of fish, 30,000 tons of shellfish, 50,000 tons of canned and frozen fruits & vegetables and 3,000 tons of frozen pastry, and frozen precooked food.³⁹

As we see , in the Credit Rating Analysis Table, the rating is calculated as 'CCC' for the years 1992, 1997,1998,1999,2001 and 2002. We can see in the graphic below that the firm has a high possibility of a financial distress since 1997 and after 2000 it was taken to the "İSTANBUL YAKLAŞIMI" for the restructuring of its debts to financial institutions. The Altman Z-Score also support this rating since 1997.

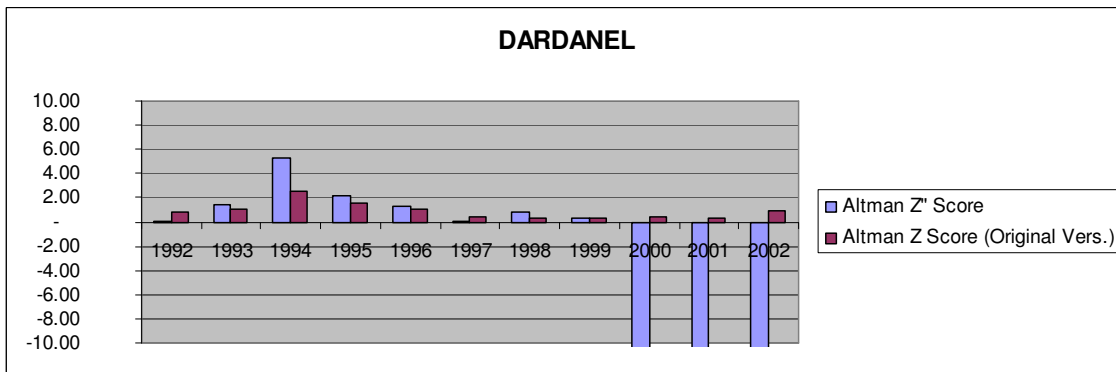


Figure 10 Z-Score Graph of "DARDANEL"

³⁹ Dardanel, Retrieved: May 5,2006 from URL: <http://www.dardanel.com/channels/3.asp?id=89>

6. GÜMÜŞSUYU

The firm was established in 1960 and went to bankrupt in 2001. The firm was dealing with the production of carpet. The firm's sales figure reached 100 million \$ before the bankruptcy.

As we see , in the Credit Rating Analysis Table, the rating is calculated as 'CCC' for the years 1998, 1999,2000 and as 'CC' for the year of bankruptcy. Since 1998 the Z Score also shows us that the firm has a high possibility of a financial distress. The bankruptcy for this firm was not a surprise.

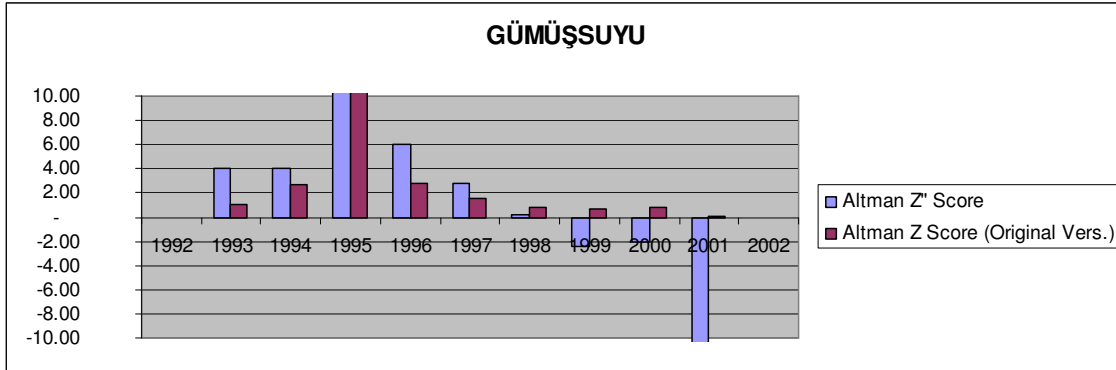


Figure 11 Z-Score Graph of “GÜMÜŞSUYU”

7. KEREVİTAŞ

KEREVITAS, established in 1969, registered and traded in Istanbul Stock Exchange, is the most prominent food company in Turkey. Our activities covers processing of various foodstuff, including vegetables, fruits, seafood products and dough products and further sales, distribution, imports and exports of such products.⁴⁰

As we see , in the Credit Rating Analysis Table, the rating is calculated in the range between “BB” and ‘A’ from 1993 to 1999. But in 2000, the rating is decreased to ‘CC’ and it is calculated as ‘CCC’ for the year 2002. We can see in the graphic below that the firm has a high possibility of a financial distress after 2000.

⁴⁰ Kerevitas, Retrieved: May 10,2006 from URL: http://www.kerevitas.com.tr/global/a_aboutus.asp

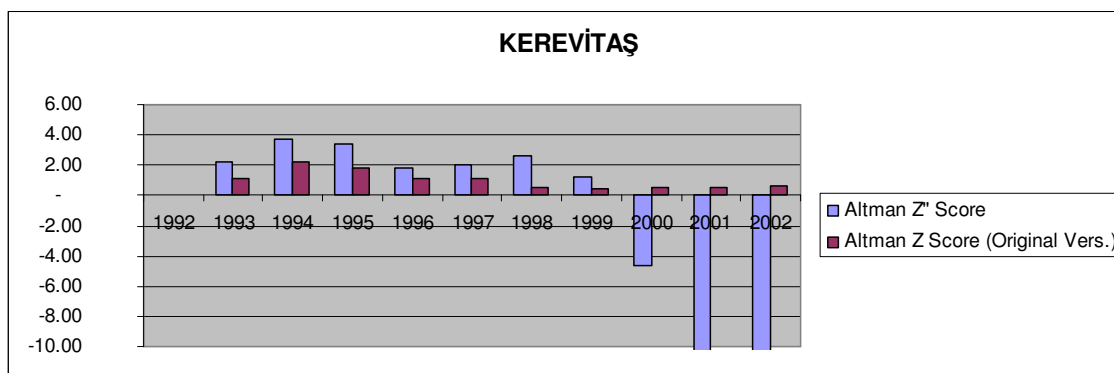


Figure 12 Z-Score Graph of “KEREVİTAŞ”

8. KONFRUT

Konfrut was a group firm of Merko, it was purchased in 2005 by a foreign company.

According to the rating system created, the rating of this firm is rated as ‘CCC’ for the years 1998,1999 and as ‘CC’ for the years 2000,2001,2002. We can see in the graphic that the Altman Z Score also support this rating. As a result, the firm doesn’t have strong financial datas and the possibility of a financial distress is medium.

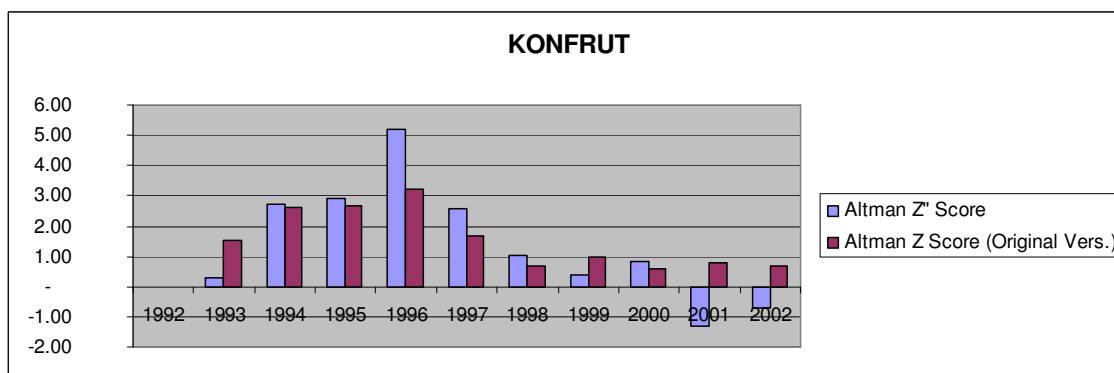


Figure 13 Z-Score Graph of “KONFRUT”

9. LÜKS KADİFE

The Company was established in 1972 and deals with the production of knitted fabric.

According to the rating system created, the firm showed a good performance from 1992 to 1998. But for the years 1999, 2000 and 2001 the possibility of financial distress increased dramatically. Altman Z Score also support this rating.

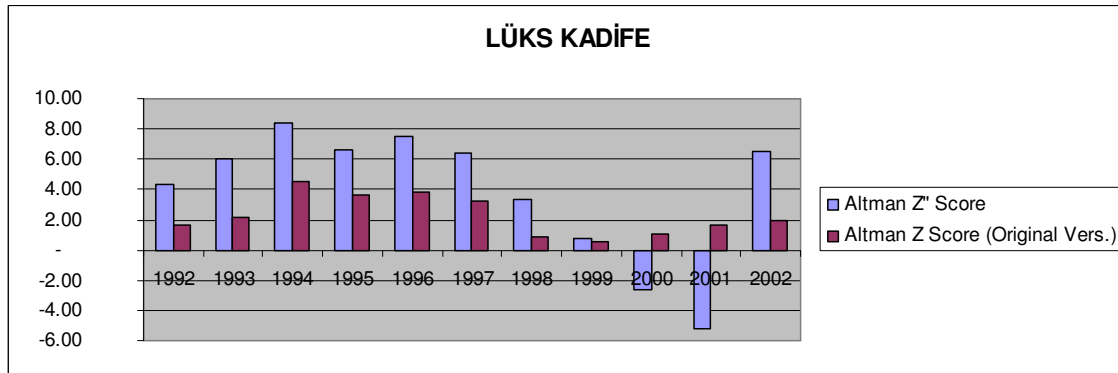


Figure 14 Z-Score Graph of “LÜKS KADİFE”

10. MARET

According to the rating system created, the rating of this firm changed between 'A' and 'BBB'. But in 2002, its rating decreased to 'CCC' because of the loss generated in this year.

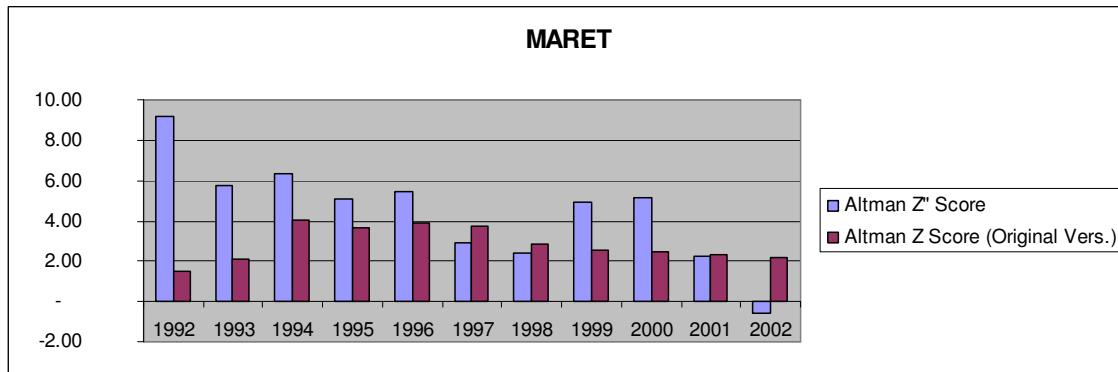


Figure 15 Z-Score Graph of "MARET"

11. MEGES

MEGES was established in 1967. The firm deals with the production of paint to the construction and automotive sector.⁴¹As we see , in the Credit Rating Analysis Table, the rating is calculated as 'CCC' after 1998. We can see in the graphic that the Altman Z Score , the firm doesn't have a strong financial datas and the possibility of a financial distress is high at the end of 2002.

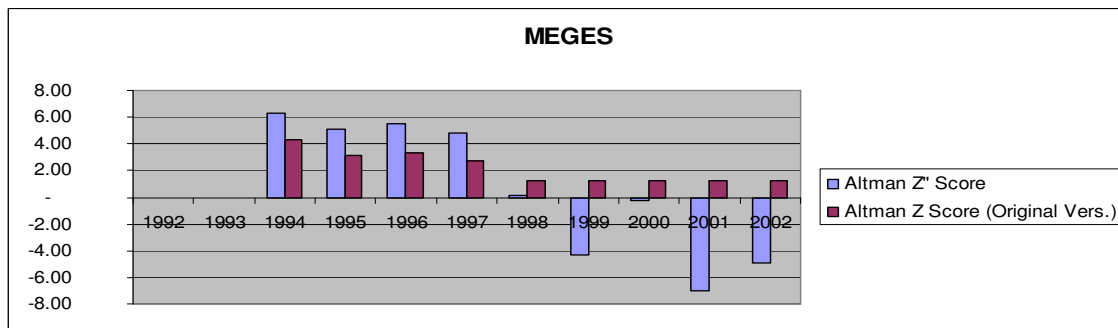


Figure 16 Z-Score Graph of "MEGES"

⁴¹ Meges, Retrieved: May 10, 2006 from URL: <http://www.meges.com.tr/meges/default.aspx#>

12. MERKO

Merko is a processor of fruits and vegetables into the raw material for the food industry world-wide. The largest processor in Turkey, Merko was established in 1982 and is proud to have served its customers and suppliers for 21 years. In 1994 Merko went public with an IPO and today the major shareholders are managing the company, including Nomikos from Greece, with most of the balance of shares quoted on the Istanbul Stock Exchange. As a group and including subsidiaries 7 factories are operating with an annual production capacity of over 100,000 mt of finished product from 500,000 mt of raw material.

According to the rating system created, the rating of this firm is between 'A' and 'BB' from 1994 to 1997. But after 1997, its rating decreased to 'CC'. We can see in the graphic that the Altman Z Score also support this decline. As a result, the firm lost strong financial position and the possibility of a financial distress increased as of 2002.

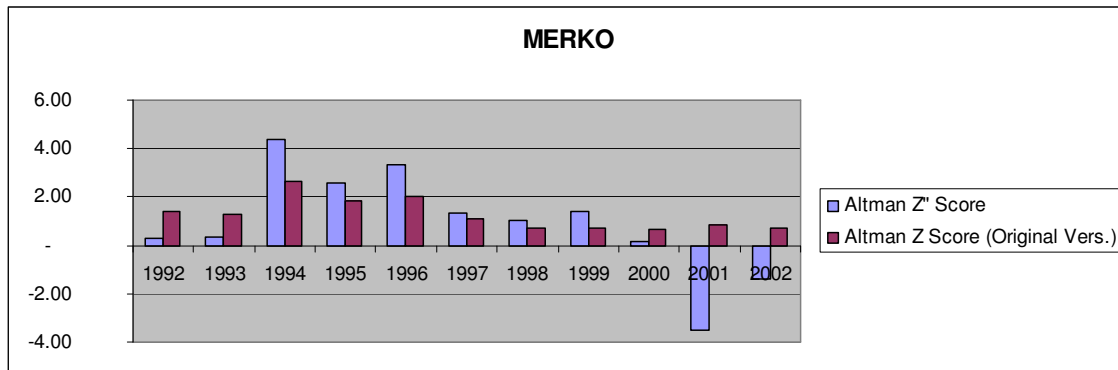


Figure 17 Z-Score Graph of "MERKO"

13. MUDURNU

Mudurnu was one of the biggest chicken meat producers of Turkey. The firm went to bankrupt in 2001. The rating system signals the default probability for the year 1999, 2000 and 2001. The bankruptcy for this firm was not a surprise.

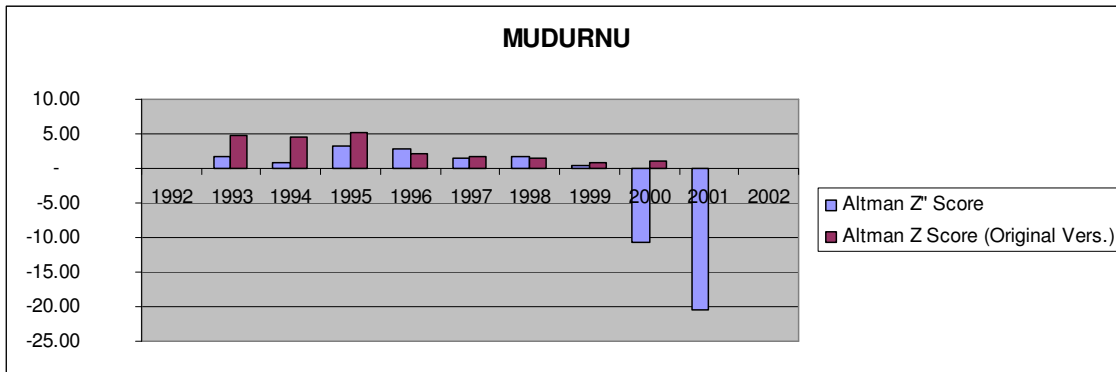


Figure 18 Z-Score Graph of "MUDURNU"

14. RAKS ELK

The Company was established in 1978. Raks Elektronik Sanayi ve Ticaret A.S.(RAKS). The Company's principal activities are the production and marketing of blank and pre-recorded audio and video cassettes, compact discs and mobile phone batteries under its own brand name. The Company is also a supplier of other media producers such as Aiwa, JVC, Konica and Kodak. The Company exports most of its products.

Raks Elk was one of the biggest electronic products producers of Turkey. The firm went to bankrupt position in 2001. The rating system signals the default probability for the year 1998,1999, 2000 and 2001. The default for this firm was not a surprise.

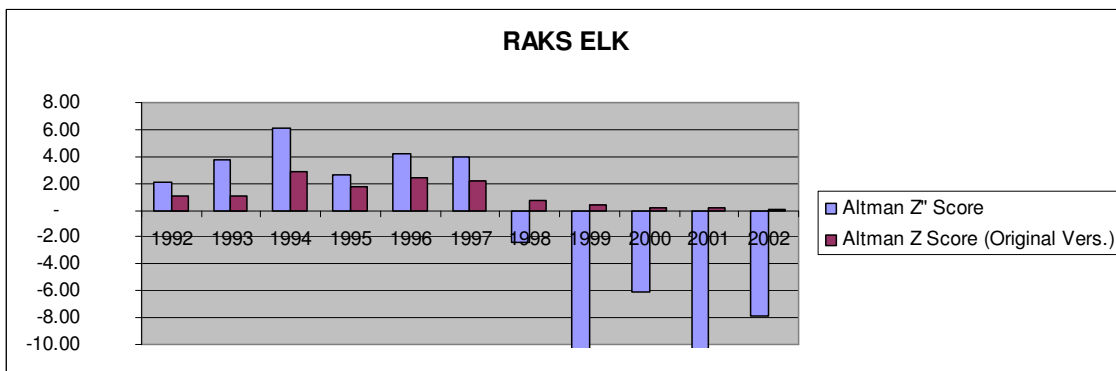


Figure 19 Z-Score Graph of "RAKS ELK"

Table 16 Credit Rating Calculation of “ARCELİK”

	1992			1993			1994			1995			1996			1997		
	Comparing with			Comparing with			Comparing with			Comparing with			Comparing with			Comparing with		
Liquidity	FS	Percentile	Calculation	FS	Percentile	Calculation	FS	Percentile	Calculation	FS	Percentile	Calculation	FS	Percentile	Calculation	FS	Percentile	Calculation
Current Ratio	178%	AAA	0.75	182%	AAA	0.75	163%	AA	0.68	180%	AAA	0.75	203%	AAA	0.75	266%	AAA	0.75
Working Capital Leverage Ratio	35%	NA		35%	NA		31%	NA		35%	NA		37%	NA		46%	NA	
Acid Test Ratio	1%	C	0.15	0%	C	0.15	0%	C	0.15	1%	C	0.15	6%	C	0.15	0%	C	0.15
Solvency-Ability To meet key term obligations																		
Interest Coverage	-150%	C	0.08	-364%	C	0.08	60%	C	0.08	-33%	C	0.08	-160%	C	0.08	294%	A	0.32
Leverage and Capital Measure																		
Debt to Assets	58%	BB	0.30	59%	BB	0.30	63%	BBB	0.35	58%	BBB	0.35	56%	BB	0.30	52%	BB	0.30
Long Term Debt to Assets	13%	AAA	0.25	16%	AAA	0.25	14%	AAA	0.25	14%	AAA	0.25	20%	AAA	0.25	24%	AA	0.23
Profitability																		
Return On Assets	17%	AAA	0.40	18%	AAA	0.40	8%	A	0.32	12%	AA	0.36	18%	AAA	0.40	19%	AAA	0.40
Return On Equity	41%	AAA	0.40	43%	AAA	0.40	21%	A	0.32	28%	A	0.32	39%	AAA	0.40	39%	AAA	0.40
EBIT/Assets	32%	AAA	0.25	27%	AAA	0.25	31%	AA	0.23	26%	AA	0.23	29%	AAA	0.25	15%	BBB	0.18
Retained Earnings/Assets	0.00%	AAA	0.25	0.02%	AAA	0.25	0.07%	AAA	0.25	0.09%	AAA	0.25	0.46%	AAA	0.25	0.31%	AAA	0.25
Net Worth/Liabilities	71%	NA		70%	NA		59%	NA		74%	NA		80%	NA		93%	NA	
Gross Product Margin	176%	AAA	0.25	175%	AAA	0.25	172%	AAA	0.25	172%	AAA	0.25	167%	AAA	0.25	37%	AAA	0.25
Net Profit Margin	8%	AAA	0.25	8%	AAA	0.25	4%	A	0.20	6%	AA	0.23	10%	AAA	0.25	11%	AAA	0.25
	3.33			3.33			3.07			3.21			3.33			3.47		
Sales/Assets	213%			210%			174%			195%			176%			168%		
Retained Earnings				1.216			9.745			22.563			226.956			304.907		
Total Assets	3,412,413			6,321,214			14,285,665			25,411,679			49,634,037			98,127,841		
ALTMAN Z'-Score	5.17	AAA	3.50	4.82	AAA	3.50	4.70	AAA	3.50	4.84	AAA	3.50	5.23	AAA	3.50	5.00	AAA	3.50
ALTMAN Z-Score	2.15	BBB	1.05	2.12	BBB	1.05	3.17	AAA	1.50	3.33	AAA	1.50	3.27	AAA	1.50	2.86	BBB	1.05
FINAL RATING	A 7.88			A 7.88			AA 8.07			AA 8.21			AA 8.33			AA 8.02		
	1998			1999			2000			2001			2002					
	Comparing with			Comparing with			Comparing with			Comparing with			Comparing with					
Liquidity	FS	Percentile	Calculation	FS	Percentile	Calculation	FS	Percentile	Calculation	FS	Percentile	Calculation	FS	Percentile	Calculation			
Current Ratio	309%	AAA	0.75	228%	AAA	0.75	179%	AAA	0.75	230%	AAA	0.75	206%	AAA	0.75			
Working Capital Leverage Ratio	49%	NA		43%	NA		35%	NA		45%	NA		40%	NA				
Acid Test Ratio	0%	C	0.15	9%	C	0.15	1%	C	0.15	53%	BBB	0.53	23%	C	0.15			
Solvency-Ability To meet key term obligations																		
Interest Coverage	273%	A	0.32	290%	AA	0.36	417%	AA	0.36	121%	BBB	0.28	460%	AA	0.36			
Leverage and Capital Measure																		
Debt to Assets	45%	BB	0.30	50%	BB	0.30	54%	BB	0.30	60%	BBB	0.35	57%	BBB	0.35			
Long Term Debt to Assets	22%	AA	0.23	16%	A	0.20	10%	A	0.20	25%	AA	0.23	20%	AA	0.23			
Profitability																		
Return On Assets	16%	AAA	0.40	15%	AAA	0.40	10%	AAA	0.40	2%	A	0.32	13%	AAA	0.40			
Return On Equity	30%	AAA	0.40	30%	AAA	0.40	22%	AA	0.36	6%	BBB	0.28	30%	AAA	0.40			
EBIT/Assets	11%	BB	0.15	14%	BBB	0.18	12%	A	0.20	-7%	C	0.05	16%	A	0.20			
Retained Earnings/Assets	0.02%	AAA	0.25	0.04%	AAA	0.25	0.00%	AAA	0.25	0.00%	AAA	0.25	0.00%	AAA	0.25			
Net Worth/Liabilities	121%	NA		101%	NA		84%	NA		67%	NA		74%	NA				
Gross Product Margin	36%	AAA	0.25	39%	AAA	0.25	34%	AAA	0.25	31%	AAA	0.25	36%	AAA	0.25			
Net Profit Margin	9%	AAA	0.25	11%	AAA	0.25	7%	AAA	0.25	2%	A	0.20	10%	AAA	0.25			
	3.45			3.49			3.47			3.48			3.59					
Sales/Assets	174%			140%			136%			138%			132%					
Retained Earnings				167,280			-			-			-					
Total Assets	37,419			406,603,703			636,838,921			875,319,434			1,455,727,969					
ALTMAN Z'-Score	5.23	AAA	3.50	4.80	AAA	3.50	3.99	AAA	3.50	3.20	AAA	3.50	4.48	AAA	3.50			
ALTMAN Z-Score	1.76	C	0.30	1.41	C	0.30	1.37	C	0.30	1.39	C	0.30	1.33	C	0.30			
FINAL RATING	A 7.25			A 7.29			A 7.27			A 7.28			A 7.39					

Table 17 Credit Rating Calculation of “ARCELİK” (Scenario A)

	1992			1993			1994			1995			1996			1997		
	Comparing with			Comparing with			Comparing with			Comparing with			Comparing with			Comparing with		
	FS	Percentile	Calculation	FS	Percentile	Calculation	FS	Percentile	Calculation	FS	Percentile	Calculation	FS	Percentile	Calculation	FS	Percentile	Calculation
Liquidity																		
Current Ratio	178%	AAA	0.10	182%	AAA	0.10	163%	AA	0.09	180%	AAA	0.10	203%	AAA	0.10	266%	AAA	0.10
Working Capital Leverage Ratio	35%	NA		35%	NA		31%	NA		35%	NA		37%	NA		46%	NA	
Acid Test Ratio	1%	C	0.02	0%	C	0.02	0%	C	0.02	1%	C	0.02	6%	C	0.02	0%	C	0.02
Solvency-Ability To meet key term obligations																		
Interest Coverage	-150%	C	0.34	-364%	C	0.34	60%	C	0.34	-33%	C	0.34	-160%	C	0.34	294%	A	1.36
Leverage and Capital Measure																		
Debt to Assets	58%	BB	0.15	59%	BB	0.15	63%	BBB	0.18	58%	BBB	0.18	56%	BB	0.15	52%	BB	0.15
Long Term Debt to Assets	13%	AAA	0.20	16%	AAA	0.20	14%	AAA	0.20	14%	AAA	0.20	20%	AAA	0.20	24%	AA	0.18
Profitability																		
Return On Assets	17%	AAA	1.00	18%	AAA	1.00	8%	A	0.80	12%	AA	0.90	18%	AAA	1.00	19%	AAA	1.00
Return On Equity	41%	AAA	0.25	43%	AAA	0.25	21%	A	0.20	28%	A	0.20	39%	AAA	0.25	39%	AAA	0.25
EBIT/Assets	32%	AAA	0.25	27%	AAA	0.25	31%	AA	0.23	26%	AA	0.23	29%	AAA	0.25	15%	BBB	0.18
Retained Earnings/Assets	0.00%	AAA	0.25	0.02%	AAA	0.25	0.07%	AAA	0.25	0.09%	AAA	0.25	0.46%	AAA	0.25	0.31%	AAA	0.25
Net Worth/Liabilities	71%	NA		70%	NA		59%	NA		74%	NA		80%	NA		93%	NA	
Gross Product Margin	176%	AAA	0.25	175%	AAA	0.25	172%	AAA	0.25	172%	AAA	0.25	167%	AAA	0.25	37%	AAA	0.25
Net Profit Margin	8%	AAA	0.25	8%	AAA	0.25	4%	A	0.20	6%	AA	0.23	10%	AAA	0.25	11%	AAA	0.25
			3.06			3.06			2.75			2.89			3.06			3.99
Sales/Assets	213%			210%			174%			195%			176%			168%		
Retained Earnings				1,216			9,745			22,563			226,956			304,907		
Total Assets	3,412,413			6,321,214			14,285,685			25,411,679			49,634,037			98,127,841		
ALTMAN Z"-Score	5.17	AAA	3.50	4.82	AAA	3.50	4.70	AAA	3.50	4.84	AAA	3.50	5.23	AAA	3.50	5.00	AAA	3.50
ALTMAN Z-Score	2.15	BBB	1.05	2.12	BBB	1.05	3.17	AAA	1.50	3.33	AAA	1.50	3.27	AAA	1.50	2.86	BBB	1.05
FINAL RATING	A			A			A			A			A			AA		
	7.61			7.61			7.75			7.89			8.06			8.54		
	1998			1999			2000			2001			2002					
	Comparing with			Comparing with			Comparing with			Comparing with			Comparing with					
	FS	Percentile	Calculation	FS	Percentile	Calculation	FS	Percentile	Calculation	FS	Percentile	Calculation	FS	Percentile	Calculation			
Liquidity																		
Current Ratio	309%	AAA	0.10	228%	AAA	0.10	179%	AAA	0.10	230%	AAA	0.10	206%	AAA	0.10			
Working Capital Leverage Ratio	49%	NA		43%	NA		35%	NA		45%	NA		40%	NA				
Acid Test Ratio	0%	C	0.02	9%	C	0.02	1%	C	0.02	53%	BBB	0.07	23%	C	0.02			
Solvency-Ability To meet key term obligations																		
Interest Coverage	273%	A	1.36	290%	AA	1.53	417%	AA	1.53	121%	BBB	1.19	460%	AA	1.53			
Leverage and Capital Measure																		
Debt to Assets	45%	BB	0.15	50%	BB	0.15	54%	BB	0.15	60%	BBB	0.18	57%	BBB	0.18			
Long Term Debt to Assets	22%	AA	0.18	16%	A	0.16	10%	A	0.16	25%	AA	0.18	20%	AA	0.18			
Profitability																		
Return On Assets	16%	AAA	1.00	15%	AAA	1.00	10%	AAA	1.00	2%	A	0.80	13%	AAA	1.00			
Return On Equity	30%	AAA	0.25	30%	AAA	0.25	22%	AA	0.23	6%	BBB	0.18	30%	AAA	0.25			
EBIT/Assets	11%	BB	0.15	14%	BBB	0.18	12%	A	0.20	-7%	C	0.05	16%	A	0.20			
Retained Earnings/Assets	0.02%	AAA	0.25	0.04%	AAA	0.25	0.00%	AAA	0.25	0.00%	AAA	0.25	0.00%	AAA	0.25			
Net Worth/Liabilities	121%	NA		101%	NA		84%	NA		67%	NA		74%	NA				
Gross Product Margin	36%	AAA	0.25	39%	AAA	0.25	34%	AAA	0.25	31%	AAA	0.25	36%	AAA	0.25			
Net Profit Margin	9%	AAA	0.25	11%	AAA	0.25	7%	AAA	0.25	2%	A	0.20	10%	AAA	0.25			
			3.96			4.14			4.14			3.44			4.21			
Sales/Assets	174%			140%			136%			138%			132%					
Retained Earnings				167,280			-			-			-					
Total Assets	37,419			406,603,703			636,838,921			875,319,434			1,455,727,969					
ALTMAN Z"-Score	5.23	AAA	3.50	4.80	AAA	3.50	3.99	AAA	3.50	3.20	AAA	3.50	4.48	AAA	3.50			
ALTMAN Z-Score	1.76	C	0.30	1.41	C	0.30	1.37	C	0.30	1.39	C	0.30	1.33	C	0.30			
FINAL RATING	A			A			A			A			AA			8.01		
	7.76			7.94			7.94			7.24								

Table 18 Credit Rating Calculation of “ARCELİK” (Scenario B)

	1992			1993			1994			1995			1996			1997		
	Comparing with			Comparing with			Comparing with			Comparing with			Comparing with			Comparing with		
	FS	Percentile	Calculation	FS	Percentile	Calculation	FS	Percentile	Calculation	FS	Percentile	Calculation	FS	Percentile	Calculation	FS	Percentile	Calculation
Liquidity																		
Current Ratio	178%	AAA	0.90	182%	AAA	0.90	163%	AA	0.81	180%	AAA	0.90	203%	AAA	0.90	266%	AAA	0.90
Working Capital Leverage Ratio	35%	NA		35%	NA		31%	NA		35%	NA		37%	NA		46%	NA	
Acid Test Ratio	1%	C	0.15	0%	C	0.15	0%	C	0.15	1%	C	0.15	6%	C	0.15	0%	C	0.15
Solvency-Ability To meet key term obligations																		
Interest Coverage	-150%	C	0.06	-364%	C	0.06	60%	C	0.06	-33%	C	0.06	-160%	C	0.06	294%	A	0.24
Leverage and Capital Measure																		
Debt to Assets	58%	BB	0.45	59%	BB	0.45	63%	BBB	0.53	58%	BBB	0.53	56%	BB	0.45	52%	BB	0.45
Long Term Debt to Assets	13%	AAA	0.25	16%	AAA	0.25	14%	AAA	0.25	14%	AAA	0.25	20%	AAA	0.25	24%	AA	0.23
Profitability																		
Return On Assets	17%	AAA	0.25	18%	AAA	0.25	8%	A	0.20	12%	AA	0.23	18%	AAA	0.25	19%	AAA	0.25
Return On Equity	41%	AAA	0.25	43%	AAA	0.25	21%	A	0.20	28%	A	0.20	39%	AAA	0.25	39%	AAA	0.25
EBIT/Assets	32%	AAA	0.25	27%	AAA	0.25	31%	AA	0.23	26%	AA	0.23	29%	AAA	0.25	15%	BBB	0.18
Retained Earnings/Assets	0.00%	AAA	0.25	0.02%	AAA	0.25	0.07%	AAA	0.25	0.09%	AAA	0.25	0.46%	AAA	0.25	0.31%	AAA	0.25
Net Worth/Liabilities	71%	NA		70%	NA		59%	NA		74%	NA		80%	NA		93%	NA	
Gross Product Margin	176%	AAA	0.25	175%	AAA	0.25	172%	AAA	0.25	172%	AAA	0.25	167%	AAA	0.25	37%	AAA	0.25
Net Profit Margin	8%	AAA	0.30	8%	AAA	0.30	4%	A	0.24	6%	AA	0.27	10%	AAA	0.30	11%	AAA	0.30
			3.36			3.36			3.16			3.31			3.36			3.44
Sales/Assets	213%			210%			174%			195%			176%			168%		
Retained Earnings				1,216			9,745			22,563			226,956			304,907		
Total Assets	3,412,413			6,321,214			14,285,685			25,411,679			49,634,037			98,127,841		
ALTMAN Z"-Score	5.17	AAA	3.50	4.82	AAA	3.50	4.70	AAA	3.50	4.84	AAA	3.50	5.23	AAA	3.50	5.00	AAA	3.50
ALTMAN Z-Score	2.15	BBB	1.05	2.12	BBB	1.05	3.17	AAA	1.50	3.33	AAA	1.50	3.27	AAA	1.50	2.86	BBB	1.05
FINAL RATING	A	7.91		A	7.91		AA	8.16		AA	8.31		AA	8.36		A	7.99	
	1998			1999			2000			2001			2002					
	Comparing with			Comparing with			Comparing with			Comparing with			Comparing with					
	FS	Percentile	Calculation	FS	Percentile	Calculation	FS	Percentile	Calculation	FS	Percentile	Calculation	FS	Percentile	Calculation			
Liquidity																		
Current Ratio	309%	AAA	0.90	228%	AAA	0.90	179%	AAA	0.90	230%	AAA	0.90	206%	AAA	0.90			
Working Capital Leverage Ratio	49%	NA		43%	NA		35%	NA		45%	NA		40%	NA				
Acid Test Ratio	0%	C	0.15	9%	C	0.15	1%	C	0.15	53%	BBB	0.53	23%	C	0.15			
Solvency-Ability To meet key term obligations																		
Interest Coverage	273%	A	0.24	290%	AA	0.27	417%	AA	0.27	121%	BBB	0.21	460%	AA	0.27			
Leverage and Capital Measure																		
Debt to Assets	45%	BB	0.45	50%	BB	0.45	54%	BB	0.45	60%	BBB	0.53	57%	BBB	0.53			
Long Term Debt to Assets	22%	AA	0.23	16%	A	0.20	10%	A	0.20	25%	AA	0.23	20%	AA	0.23			
Profitability																		
Return On Assets	16%	AAA	0.25	15%	AAA	0.25	10%	AAA	0.25	2%	A	0.20	13%	AAA	0.25			
Return On Equity	30%	AAA	0.25	30%	AAA	0.25	22%	AA	0.23	6%	BBB	0.18	30%	AAA	0.25			
EBIT/Assets	11%	BB	0.15	14%	BBB	0.18	12%	A	0.20	-7%	C	0.05	16%	A	0.20			
Retained Earnings/Assets	0.02%	AAA	0.25	0.04%	AAA	0.25	0.00%	AAA	0.25	0.00%	AAA	0.25	0.00%	AAA	0.25			
Net Worth/Liabilities	121%	NA		101%	NA		84%	NA		67%	NA		74%	NA				
Gross Product Margin	36%	AAA	0.25	39%	AAA	0.25	34%	AAA	0.25	31%	AAA	0.25	36%	AAA	0.25			
Net Profit Margin	9%	AAA	0.30	11%	AAA	0.30	7%	AAA	0.30	2%	A	0.24	10%	AAA	0.30			
			3.42			3.45			3.45			3.55			3.57			
Sales/Assets	174%			140%			136%			138%			132%					
Retained Earnings				167,280			-			-			-					
Total Assets	37,419			406,603,703			636,838,921			875,319,434			1,455,727,969					
ALTMAN Z"-Score	5.23	AAA	3.50	4.80	AAA	3.50	3.99	AAA	3.50	3.20	AAA	3.50	4.48	AAA	3.50			
ALTMAN Z-Score	1.76	C	0.30	1.41	C	0.30	1.37	C	0.30	1.39	C	0.30	1.33	C	0.30			
FINAL RATING	A	7.22		A	7.25		A	7.25		A	7.35		A	7.37				

Table 19 Credit Rating Calculation of “BANViT”

	1992			1993			1994			1995			1996			1997		
	Comparing with			Comparing with			Comparing with			Comparing with			Comparing with			Comparing with		
	FS	Percentile	Calculation	FS	Percentile	Calculation	FS	Percentile	Calculation	FS	Percentile	Calculation	FS	Percentile	Calculation	FS	Percentile	Calculation
Liquidity																		
Current Ratio	163%	AA	0.68	154%	AA	0.68	113%	BBB	0.53	165%	AAA	0.75	102%	BB	0.45	133%	A	0.60
Working Capital Leverage Ratio	21%	NA		22%	NA		7%	NA		27%	NA		1%	NA		18%	NA	
Acid Test Ratio	12%	C	0.15	13%	C	0.15	11%	C	0.15	65%	A	0.60	13%	C	0.15	30%	C	0.15
Solvency-Ability To meet key term obligations																		
Interest Coverage	2752%	C	0.08	56%	C	0.08	193%	C	0.08	1095%	C	0.08	79%	BBB	0.28	355%	A	0.32
Leverage and Capital Measure																		
Debt to Assets	56%	BB	0.30	57%	BB	0.30	61%	BBB	0.35	47%	BB	0.30	64%	BBB	0.35	66%	BBB	0.35
Long Term Debt to Assets	23%	AAA	0.25	17%	AAA	0.25	9%	AAA	0.25	5%	AAA	0.25	5%	AAA	0.25	12%	A	0.20
Profitability																		
Return On Assets	18%	AAA	0.40	12%	AAA	0.40	14%	AAA	0.40	34%	AAA	0.40	1%	BB	0.24	15%	AAA	0.40
Return On Equity	40%	AAA	0.40	27%	A	0.32	35%	AA	0.36	64%	AAA	0.40	3%	C	0.08	43%	AAA	0.40
EBIT/Assets	19%	A	0.20	35%	AAA	0.25	30%	AA	0.23	59%	AAA	0.25	11%	BBB	0.18	25%	AA	0.23
Retained Earnings/Assets	0.00%	AAA	0.25	0.88%	AAA	0.25	2.44%	AAA	0.25	1.95%	AAA	0.25	10.55%	AAA	0.25	5.46%	AAA	0.25
Net Worth/Liabilities	79%	NA		75%	NA		64%	NA		113%	NA		56%	NA		51%	NA	
Gross Product Margin	180%	AAA	0.25	174%	AAA	0.25	178%	AAA	0.25	170%	AAA	0.25	186%	AAA	0.25	23%	AA	0.23
Net Profit Margin	5%	AAA	0.25	3%	A	0.20	5%	A	0.20	11%	AAA	0.25	0%	C	0.05	6%	AAA	0.25
			3.21			3.13			3.04			3.78			2.53			3.37
Sales/Assets	333%			346%			295%			303%			338%			244%		
Retained Earnings				1,216			9,745			22,563			226,956			304,907		
Total Assets	70,027			138,030			399,333			1,155,985			2,151,898			5,580,934		
ALTMAN Z"-Score	3.43	AAA	3.50	4.62	AAA	3.50	3.19	AAA	3.50	6.99	AAA	3.50	1.71	BBB	2.45	3.54	AAA	3.50
ALTMAN Z-Score	3.34	AAA	1.50	3.47	AAA	1.50	4.20	AAA	1.50	5.54	AAA	1.50	4.04	AAA	1.50	3.59	AAA	1.50
FINAL RATING	AA	8.21		AA	8.13		AA	8.04		AA	8.78		BBB	6.48		AA	8.37	

	1998			1999			2000			2001			2002					
	Comparing with			Comparing with			Comparing with			Comparing with			Comparing with					
	FS	Percentile	Calculation	FS	Percentile	Calculation	FS	Percentile	Calculation	FS	Percentile	Calculation	FS	Percentile	Calculation			
Liquidity																		
Current Ratio	215%	AAA	0.75	214%	AAA	0.75	223%	AAA	0.75	124%	A	0.60	132%	A	0.60			
Working Capital Leverage Ratio	43%	NA		38%	NA		37%	NA		9%	NA		12%	NA				
Acid Test Ratio	55%	BBB	0.53	58%	BBB	0.53	78%	A	0.60	7%	C	0.15	17%	C	0.15			
Solvency-Ability To meet key term obligations																		
Interest Coverage	2224%	AAA	0.40	2183%	AAA	0.40	169%	BBB	0.28	540%	C	0.08	237%	A	0.32			
Leverage and Capital Measure																		
Debt to Assets	45%	BB	0.30	46%	C	0.10	57%	BBB	0.35	82%	AA	0.45	64%	A	0.40			
Long Term Debt to Assets	8%	BBB	0.18	12%	A	0.20	27%	AAA	0.25	45%	AAA	0.25	27%	AAA	0.25			
Profitability																		
Return On Assets	41%	AAA	0.40	26%	AAA	0.40	2%	BBB	0.28	-13%	C	0.08	3%	A	0.32			
Return On Equity	74%	AAA	0.40	47%	AAA	0.40	4%	BB	0.24	-71%	C	0.08	9%	BBB	0.28			
EBIT/Assets	57%	AAA	0.25	41%	AAA	0.25	2%	C	0.05	-14%	C	0.05	3%	C	0.05			
Retained Earnings/Assets	0.23%	AAA	0.25	0.56%	AAA	0.25	0.00%	AAA	0.25	0.00%	AAA	0.25	0.00%	AAA	0.25			
Gross Product Margin	41%	AAA	0.25	31%	AAA	0.25	20%	AAA	0.25	11%	C	0.05	19%	AAA	0.25			
Net Profit Margin	23%	AAA	0.25	15%	AAA	0.25	1%	BBB	0.18	-8%	C	0.05	2%	BBB	0.18			
			3.95			3.78			3.48			2.09			3.05			
Sales/Assets	179%			174%			159%			159%			169%					
Retained Earnings	37,419			167,280			-			-			-					
Total Assets	16,224,091			28,857,975			51,157,904			83,221,457			109,132,767					
ALTMAN Z"-Score	7.91	AAA	3.50	6.55	AAA	3.50	3.32	AAA	3.50	-0.15	C	0.70	1.53	BBB	2.45			
ALTMAN Z-Score	1.82	BBB	1.05	1.77	C	0.30	1.59	C	0.30	1.58	C	0.30	1.70	C	0.30			
FINAL RATING	AA	8.50		A	7.58		A	7.28		CCC	3.09		BB	5.80				

Table 20 Credit Rating Calculation of "BERDAN TEKS"

	1992			1993			1994			1995			1996			1997		
	Comparing with			Comparing with			Comparing with			Comparing with			Comparing with			Comparing with		
Liquidity	FS	Percentile	Calculation	FS	Percentile	Calculation	FS	Percentile	Calculation	FS	Percentile	Calculation	FS	Percentile	Calculation	FS	Percentile	Calculation
Current Ratio	149%	AA	0.68	100%	BB	0.45	115%	BBB	0.53	142%	AA	0.68	173%	AAA	0.75	169%	AAA	0.75
Working Capital Leverage Ratio	18%	NA		0%	NA		7%	NA		14%	NA		19%	NA		18%	NA	
Acid Test Ratio	4%	C	0.15	4%	C	0.15	2%	C	0.15	8%	C	0.15	3%	C	0.15	3%	C	0.15
Solvency-Ability To meet key term obligations																		
Interest Coverage	91%	BBB	0.28	96%	A	0.32	87%	C	0.08	30%	BB	0.24	54%	BBB	0.28	142%	BBB	0.28
Leverage and Capital Measure																		
Debt to Assets	55%	BB	0.30	67%	BBB	0.35	54%	BB	0.30	49%	BB	0.30	45%	C	0.10	45%	C	0.10
Long Term Debt to Assets	18%	AAA	0.25	12%	AAA	0.25	8%	AAA	0.25	16%	AAA	0.25	19%	AAA	0.25	19%	AA	0.23
Profitability																		
Return On Assets	1%	B	0.20	1%	C	0.08	2%	BB	0.24	9%	AA	0.36	5%	A	0.32	5%	A	0.32
Return On Equity	3%	C	0.08	2%	C	0.08	4%	C	0.08	18%	BBB	0.28	9%	BB	0.24	8%	BB	0.24
EBIT/Assets	19%	AA	0.23	16%	A	0.20	23%	AA	0.23	25%	AA	0.23	17%	A	0.20	-5%	C	0.05
Retained Earnings/Assets	0.00%	AAA	0.25	0.08%	AAA	0.25	0.31%	AAA	0.25	0.40%	AAA	0.25	1.74%	AAA	0.25	2.33%	AAA	0.25
Net Worth/Liabilities	83%	NA		50%	NA		84%	NA		104%	NA		124%	NA		121%	NA	
Gross Product Margin	172%	AAA	0.25	169%	AAA	0.25	165%	AAA	0.25	159%	AAA	0.25	161%	AAA	0.25	39%	AAA	0.25
Net Profit Margin	2%	BB	0.15	1%	C	0.05	2%	BBB	0.18	11%	AAA	0.25	7%	AAA	0.25	6%	AAA	0.25
	2.81			2.43			2.53			3.23			3.04			2.87		
Sales/Assets	93%			73%			84%			83%			75%			75%		
Retained Earnings				1,216			9,745			22,563			226,956			304,907		
Total Assets	557,913			1,531,242			3,100,040			5,696,011			13,062,413			13,062,413		
ALTMAN Z'-Score	3.36	AAA	3.50	1.57	BBB	2.45	2.91	AAA	3.50	3.71	AAA	3.50	3.73	AAA	3.50	2.20	BBB	2.45
ALTMAN Z-Score	0.94	C	0.30	0.74	C	0.30	1.97	BBB	1.05	2.15	BBB	1.05	1.95	BBB	1.05	1.26	C	0.30
FINAL RATING	BBB 6.61			BB 5.18			A 7.08			A 7.78			A 7.59			BB 5.62		
	1998			1999			2000			2001			2002					
	Comparing with			Comparing with			Comparing with			Comparing with			Comparing with					
Liquidity	FS	Percentile	Calculation	FS	Percentile	Calculation	FS	Percentile	Calculation	FS	Percentile	Calculation	FS	Percentile	Calculation			
Current Ratio	130%	A	0.60	81%	C	0.15	139%	A	0.60	84%	C	0.15	70%	C	0.15			
Working Capital Leverage Ratio	12%	NA		-12%	NA		12%	NA		-8%	NA		-17%	NA				
Acid Test Ratio	1%	C	0.15	0%	C	0.15	1%	C	0.15	3%	C	0.15	1%	C	0.15			
Solvency-Ability To meet key term obligations																		
Interest Coverage	123%	BB	0.24	98%	C	0.08	-7%	C	0.08	-7%	C	0.08	26%	C	0.08			
Leverage and Capital Measure																		
Debt to Assets	55%	BBB	0.35	68%	A	0.40	71%	A	0.40	126%	AAA	0.50	126%	AAA	0.50			
Long Term Debt to Assets	17%	AA	0.23	6%	BBB	0.18	39%	AAA	0.25	76%	AAA	0.25	70%	AAA	0.25			
Profitability																		
Return On Assets	3%	BBB	0.28	0%	BB	0.24	-12%	C	0.08	-72%	C	0.08	-27%	C	0.08			
Return On Equity	6%	BBB	0.28	-1%	C	0.08	-42%	C	0.08	277%	AAA	0.40	102%	AAA	0.40			
EBIT/Assets	-8%	C	0.05	-15%	C	0.05	-26%	C	0.05	-124%	C	0.05	-63%	C	0.05			
Retained Earnings/Assets	0.13%	AAA	0.25	0.28%	AAA	0.25	0.00%	AAA	0.25	0.00%	AAA	0.25	0.00%	AAA	0.25			
Net Worth/Liabilities	82%	NA		46%	NA		42%	NA		-21%	NA		-21%	NA				
Gross Product Margin	40%	AAA	0.25	42%	AAA	0.25	13%	A	0.20	28%	AAA	0.25	21%	AAA	0.25			
Net Profit Margin	4%	AA	0.23	-1%	BB	0.15	-20%	C	0.05	-71%	C	0.05	-24%	C	0.05			
	2.90			1.98			2.19			2.21			2.21					
Sales/Assets	66%			48%			61%			101%			113%					
Retained Earnings				167,280			-			-			-					
Total Assets	37,419			60,004,245			66,945,975			73,246,342			85,824,721					
ALTMAN Z'-Score	1.05	C	0.70	-1.33	C	0.70	-0.48	C	0.70	-9.06	C	0.70	-5.57	C	0.70			
ALTMAN Z-Score	0.66	C	0.30	0.47	C	0.30	0.60	C	0.30	0.97	C	0.30	1.10	C	0.30			
FINAL RATING	CCC 3.90			CC 2.98			CCC 3.19			CCC 3.21			CCC 3.21					

Table 21 Credit Rating Calculation of “BERDAN TEKS” (Scenario A)

	1992			1993			1994			1995			1996			1997		
	Comparing with			Comparing with			Comparing with			Comparing with			Comparing with			Comparing with		
	FS	Percentile	Calculation	FS	Percentile	Calculation	FS	Percentile	Calculation	FS	Percentile	Calculation	FS	Percentile	Calculation	FS	Percentile	Calculation
Liquidity																		
Current Ratio	149%	AA	0.09	100%	BB	0.06	115%	BBB	0.07	142%	AA	0.09	173%	AAA	0.10	169%	AAA	0.10
Working Capital Leverage Ratio	18%	NA		0%	NA		7%	NA		14%	NA		19%	NA		18%	NA	
Acid Test Ratio	4%	C	0.02	4%	C	0.02	2%	C	0.02	8%	C	0.02	3%	C	0.02	3%	C	0.02
Solvency-Ability To meet key term obligations																		
Interest Coverage	91%	BBB	1.19	96%	A	1.36	87%	C	0.34	30%	BB	1.02	54%	BBB	1.19	142%	BBB	1.19
Leverage and Capital Measure																		
Debt to Assets	55%	BB	0.15	67%	BBB	0.18	54%	BB	0.15	49%	BB	0.15	45%	C	0.05	45%	C	0.05
Long Term Debt to Assets	18%	AAA	0.20	12%	AAA	0.20	8%	AAA	0.20	16%	AAA	0.20	19%	AAA	0.20	19%	AA	0.18
Profitability																		
Return On Assets	1%	B	0.50	1%	C	0.20	2%	BB	0.60	9%	AA	0.90	5%	A	0.80	5%	A	0.80
Return On Equity	3%	C	0.05	2%	C	0.05	4%	C	0.05	18%	BBB	0.18	9%	BB	0.15	8%	BB	0.15
EBIT/Assets	19%	AA	0.23	16%	A	0.20	23%	AA	0.23	25%	AA	0.23	17%	A	0.20	-5%	C	0.05
Retained Earnings/Assets	0.00%	AAA	0.25	0.08%	AAA	0.25	0.31%	AAA	0.25	0.40%	AAA	0.25	1.74%	AAA	0.25	2.33%	AAA	0.25
Net Worth/Liabilities	83%	NA		50%	NA		84%	NA		104%	NA		124%	NA		121%	NA	
Gross Product Margin	172%	AAA	0.25	169%	AAA	0.25	165%	AAA	0.25	159%	AAA	0.25	161%	AAA	0.25	39%	AAA	0.25
Net Profit Margin	2%	BB	0.15	1%	C	0.05	2%	BBB	0.18	11%	AAA	0.25	7%	AAA	0.25	6%	AAA	0.25
			3.08			2.82			2.33			3.53			3.46			3.29
Sales/Assets	93%			73%			84%			83%			75%			75%		
Retained Earnings				1,216			9,745			22,563			226,956			304,907		
Total Assets	557,913			1,531,242			3,100,040			5,696,011			13,062,413			13,062,413		
ALTMAN Z'-Score	3.36	AAA	3.50	1.57	BBB	2.45	2.91	AAA	3.50	3.71	AAA	3.50	3.73	AAA	3.50	2.20	BBB	2.45
ALTMAN Z-Score	0.94	C	0.30	0.74	C	0.30	1.97	BBB	1.05	2.15	BBB	1.05	1.95	BBB	1.05	1.26	C	0.30
FINAL RATING	BBB 6.88			BB 5.57			BBB 6.88			AA 8.08			AA 8.01			BBB 6.04		
	1998			1999			2000			2001			2002					
	Comparing with			Comparing with			Comparing with			Comparing with			Comparing with					
	FS	Percentile	Calculation	FS	Percentile	Calculation	FS	Percentile	Calculation	FS	Percentile	Calculation	FS	Percentile	Calculation			
Liquidity																		
Current Ratio	130%	A	0.08	81%	C	0.02	139%	A	0.08	84%	C	0.02	70%	C	0.02			
Working Capital Leverage Ratio	12%	NA		-12%	NA		12%	NA		-8%	NA		-17%	NA				
Acid Test Ratio	1%	C	0.02	0%	C	0.02	1%	C	0.02	3%	C	0.02	1%	C	0.02			
Solvency-Ability To meet key term obligations																		
Interest Coverage	123%	BB	1.02	98%	C	0.34	-7%	C	0.34	-7%	C	0.34	26%	C	0.34			
Leverage and Capital Measure																		
Debt to Assets	55%	BBB	0.18	68%	A	0.20	71%	A	0.20	126%	AAA	0.25	126%	AAA	0.25			
Long Term Debt to Assets	17%	AA	0.18	6%	BBB	0.14	39%	AAA	0.20	76%	AAA	0.20	70%	AAA	0.20			
Profitability																		
Return On Assets	3%	BBB	0.70	0%	BB	0.60	-12%	C	0.20	-72%	C	0.20	-27%	C	0.20			
Return On Equity	6%	BBB	0.18	-1%	C	0.05	-42%	C	0.05	277%	AAA	0.25	102%	AAA	0.25			
EBIT/Assets	-8%	C	0.05	-15%	C	0.05	-26%	C	0.05	-124%	C	0.05	-63%	C	0.05			
Retained Earnings/Assets	0.13%	AAA	0.25	0.28%	AAA	0.25	0.00%	AAA	0.25	0.00%	AAA	0.25	0.00%	AAA	0.25			
Net Worth/Liabilities	82%	NA		46%	NA		42%	NA		-21%	NA		-21%	NA				
Gross Product Margin	40%	AAA	0.25	42%	AAA	0.25	13%	A	0.20	28%	AAA	0.25	21%	AAA	0.25			
Net Profit Margin	4%	AA	0.23	-1%	BB	0.15	-20%	C	0.05	-71%	C	0.05	-24%	C	0.05			
			3.13			2.07			1.64			1.88			1.88			
Sales/Assets	66%			48%			61%			101%			113%					
Retained Earnings				167,280			-			-			-					
Total Assets	37,419			60,004,245			66,945,975			73,246,342			85,824,721					
ALTMAN Z'-Score	1.05	C	0.70	-1.33	C	0.70	-0.48	C	0.70	-9.06	C	0.70	-5.57	C	0.70			
ALTMAN Z-Score	0.66	C	0.30	0.47	C	0.30	0.60	C	0.30	0.97	C	0.30	1.10	C	0.30			
FINAL RATING	B 4.13			CCC 3.07			CC 2.64			CC 2.88			CC 2.88					

Table 22 Credit Rating Calculation of “BERDAN TEKS” (Scenario B)

	1992			1993			1994			1995			1996			1997		
	Comparing with			Comparing with			Comparing with			Comparing with			Comparing with			Comparing with		
	FS	Percentile	Calculation	FS	Percentile	Calculation	FS	Percentile	Calculation	FS	Percentile	Calculation	FS	Percentile	Calculation	FS	Percentile	Calculation
Liquidity																		
Current Ratio	149%	AA	0.81	100%	BB	0.54	115%	BBB	0.63	142%	AA	0.81	173%	AAA	0.90	169%	AAA	0.90
Working Capital Leverage Ratio	18%	NA		0%	NA		7%	NA		14%	NA		19%	NA		18%	NA	
Acid Test Ratio	4%	C	0.15	4%	C	0.15	2%	C	0.15	8%	C	0.15	3%	C	0.15	3%	C	0.15
Solvency-Ability To meet key term obligations																		
Interest Coverage	91%	BBB	0.21	96%	A	0.24	87%	C	0.06	30%	BB	0.18	54%	BBB	0.21	142%	BBB	0.21
Leverage and Capital Measure																		
Debt to Assets	55%	BB	0.45	67%	BBB	0.53	54%	BB	0.45	49%	BB	0.45	45%	C	0.15	45%	C	0.15
Long Term Debt to Assets	18%	AAA	0.25	12%	AAA	0.25	8%	AAA	0.25	16%	AAA	0.25	19%	AAA	0.25	19%	AA	0.23
Profitability																		
Return On Assets	1%	B	0.13	1%	C	0.05	2%	BB	0.15	9%	AA	0.23	5%	A	0.20	5%	A	0.20
Return On Equity	3%	C	0.05	2%	C	0.05	4%	C	0.05	18%	BBB	0.18	9%	BB	0.15	8%	BB	0.15
EBIT/Assets	19%	AA	0.23	16%	A	0.20	23%	AA	0.23	25%	AA	0.23	17%	A	0.20	-5%	C	0.05
Retained Earnings/Assets	0.00%	AAA	0.25	0.08%	AAA	0.25	0.31%	AAA	0.25	0.40%	AAA	0.25	1.74%	AAA	0.25	2.33%	AAA	0.25
Net Worth/Liabilities	83%	NA		50%	NA		84%	NA		104%	NA		124%	NA		121%	NA	
Gross Product Margin	172%	AAA	0.25	169%	AAA	0.25	165%	AAA	0.25	159%	AAA	0.25	161%	AAA	0.25	39%	AAA	0.25
Net Profit Margin	2%	BB	0.18	1%	C	0.06	2%	BBB	0.21	11%	AAA	0.30	7%	AAA	0.30	6%	AAA	0.30
	2.95			2.57			2.68			3.27			3.01			2.84		
Sales/Assets	93%			73%			84%			83%			75%			75%		
Retained Earnings				1,216			9,745			22,563			226,956			304,907		
Total Assets	557,913			1,531,242			3,100,040			5,696,011			13,062,413			13,062,413		
ALTMAN Z'-Score	3.36	AAA	3.50	1.57	BBB	2.45	2.91	AAA	3.50	3.71	AAA	3.50	3.73	AAA	3.50	2.20	BBB	2.45
ALTMAN Z-Score	0.94	C	0.30	0.74	C	0.30	1.97	BBB	1.05	2.15	BBB	1.05	1.95	BBB	1.05	1.26	C	0.30
FINAL RATING	BBB 6.75			BB 5.32			A 7.23			A 7.82			A 7.56			BB 5.59		
	1998			1999			2000			2001			2002					
	Comparing with			Comparing with			Comparing with			Comparing with			Comparing with					
	FS	Percentile	Calculation	FS	Percentile	Calculation	FS	Percentile	Calculation	FS	Percentile	Calculation	FS	Percentile	Calculation			
Liquidity																		
Current Ratio	130%	A	0.72	81%	C	0.18	139%	A	0.72	84%	C	0.18	70%	C	0.18			
Working Capital Leverage Ratio	12%	NA		-12%	NA		12%	NA		-8%	NA		-17%	NA				
Acid Test Ratio	1%	C	0.15	0%	C	0.15	1%	C	0.15	3%	C	0.15	1%	C	0.15			
Solvency-Ability To meet key term obligations																		
Interest Coverage	123%	BB	0.18	98%	C	0.06	-7%	C	0.06	-7%	C	0.06	26%	C	0.06			
Leverage and Capital Measure																		
Debt to Assets	55%	BBB	0.53	68%	A	0.60	71%	A	0.60	126%	AAA	0.75	126%	AAA	0.75			
Long Term Debt to Assets	17%	AA	0.23	6%	BBB	0.18	39%	AAA	0.25	76%	AAA	0.25	70%	AAA	0.25			
Profitability																		
Return On Assets	3%	BBB	0.18	0%	BB	0.15	-12%	C	0.05	-72%	C	0.05	-27%	C	0.05			
Return On Equity	6%	BBB	0.18	-1%	C	0.05	-42%	C	0.05	277%	AAA	0.25	102%	AAA	0.25			
EBIT/Assets	-8%	C	0.05	-15%	C	0.05	-26%	C	0.05	-124%	C	0.05	-63%	C	0.05			
Retained Earnings/Assets	0.13%	AAA	0.25	0.28%	AAA	0.25	0.00%	AAA	0.25	0.00%	AAA	0.25	0.00%	AAA	0.25			
Net Worth/Liabilities	82%	NA		46%	NA		42%	NA		-21%	NA		-21%	NA				
Gross Product Margin	40%	AAA	0.25	42%	AAA	0.25	13%	A	0.20	28%	AAA	0.25	21%	AAA	0.25			
Net Profit Margin	4%	AA	0.27	-1%	BB	0.18	-20%	C	0.06	-71%	C	0.06	-24%	C	0.06			
	2.97			2.10			2.44			2.30			2.30					
Sales/Assets	66%			48%			61%			101%			113%					
Retained Earnings				167,280			-			-			-					
Total Assets	37,419			60,004,245			66,945,975			73,246,342			85,824,721					
ALTMAN Z'-Score	1.05	C	0.70	-1.33	C	0.70	-0.48	C	0.70	-9.06	C	0.70	-5.57	C	0.70			
ALTMAN Z-Score	0.66	C	0.30	0.47	C	0.30	0.60	C	0.30	0.97	C	0.30	1.10	C	0.30			
FINAL RATING	CCC 3.97			CCC 3.10			CCC 3.44			CCC 3.30			CCC 3.30					

Table 23 Credit Rating Calculation of “CBS”

	1992			1993			1994			1995			1996			1997		
	Comparing with			Comparing with			Comparing with			Comparing with			Comparing with			Comparing with		
	FS	Percentile	Calculation	FS	Percentile	Calculation	FS	Percentile	Calculation	FS	Percentile	Calculation	FS	Percentile	Calculation	FS	Percentile	Calculation
Liquidity																		
Current Ratio	126%	A	0.60	138%	AA	0.68	127%	A	0.60	110%	BBB	0.53	109%	BBB	0.53	86%	C	0.15
Working Capital Leverage Ratio	19%	NA		25%	NA		19%	NA		6%	NA		7%	NA		-11%	NA	
Acid Test Ratio	6%	C	0.15	9%	C	0.15	2%	C	0.15	4%	C	0.15	3%	C	0.15	2%	C	0.15
Solvency-Ability To meet key term obligations																		
Interest Coverage	90%	BBB	0.28	#DIV/0!	#DIV/0!		79%	C	0.08	#DIV/0!	#DIV/0!		68%	BBB	0.28	70%	C	0.08
Leverage and Capital Measure																		
Debt to Assets	75%	BBB	0.35	81%	A	0.40	83%	AA	0.45	74%	A	0.40	81%	AA	0.45	77%	AA	0.45
Long Term Debt to Assets	2%	A	0.20	15%	AAA	0.25	11%	AAA	0.25	10%	AAA	0.25	7%	AAA	0.25	2%	C	0.05
Profitability																		
Return On Assets	3%	BBB	0.28	0%	C	0.08	2%	BB	0.24	0%	C	0.08	1%	BB	0.24	1%	C	0.08
Return On Equity	13%	BB	0.24	0%	C	0.08	9%	BB	0.24	0%	C	0.08	8%	BB	0.24	3%	C	0.08
EBIT/Assets	39%	AAA	0.25	0%	C	0.05	10%	BB	0.15	0%	C	0.05	8%	BB	0.15	3%	C	0.05
Retained Earnings/Assets	0.00%	AAA	0.25	0.23%	AAA	0.25	0.68%	AAA	0.25	0.70%	AAA	0.25	4.49%	AAA	0.25	2.82%	AAA	0.25
Net Worth/Liabilities	33%	NA		24%	NA		21%	NA		35%	NA		23%	NA		30%	NA	
Gross Product Margin	159%	AAA	0.25	#DIV/0!	#DIV/0!		169%	AAA	0.25		C	0.05	169%	AAA	0.25	169%	AAA	0.25
Net Profit Margin	3%	BBB	0.18	#DIV/0!	#DIV/0!		3%	A	0.20		C	0.05	5%	AA	0.23	4%	AA	0.23
			3.03			1.94			2.86			1.89			3.01			1.82
Sales/Assets	117%			0%			48%			0%			29%			14%		
Retained Earnings				1,216			9,745			22,563			226,956			304,907		
Total Assets	309,491			530,158			1,425,729			3,204,574			5,057,782			10,798,799		
ALTMAN Z'-Score	4.17	AAA	3.50	1.91	BBB	2.45	2.20	BBB	2.45	0.80	C	0.70	1.35	BBB	2.45	-0.06	C	0.70
ALTMAN Z-Score	1.18	C	0.30	0.00	C	0.30	1.03	C	0.30	0.20	C	0.30	0.71	C	0.30	0.32	C	0.30
FINAL RATING	BBB 6.83			B 4.69			BB 5.61			CC 2.89			BB 5.76			CC 2.82		
	1998			1999			2000			2001			2002					
	Comparing with			Comparing with			Comparing with			Comparing with			Comparing with					
	FS	Percentile	Calculation	FS	Percentile	Calculation	FS	Percentile	Calculation	FS	Percentile	Calculation	FS	Percentile	Calculation			
Liquidity																		
Current Ratio	97%	C	0.15	105%	BB	0.45	111%	BB	0.45	36%	C	0.15	27%	C	0.15			
Working Capital Leverage Ratio	-3%	NA		3%	NA		8%	NA		-132%	NA		-222%	NA				
Acid Test Ratio	3%	C	0.15	2%	C	0.15	3%	C	0.15	0%	C	0.15	0%	C	0.15			
Solvency-Ability To meet key term obligations																		
Interest Coverage	61%	C	0.08	88%	C	0.08	86%	C	0.08	8%	C	0.08	7%	C	0.08			
Leverage and Capital Measure																		
Debt to Assets	94%	AAA	0.50	98%	AAA	0.50	147%	AAA	0.50	315%	AAA	0.50	348%	AAA	0.50			
Long Term Debt to Assets	2%	BB	0.15	33%	AAA	0.25	75%	AAA	0.25	108%	AAA	0.25	45%	AAA	0.25			
Profitability																		
Return On Assets	1%	BB	0.24	0%	BB	0.24	1%	BB	0.24	-177%	C	0.08	-80%	C	0.08			
Return On Equity	14%	A	0.32	18%	AA	0.36	-3%	C	0.08	82%	AAA	0.40	32%	AAA	0.40			
EBIT/Assets	4%	C	0.05	3%	C	0.05	11%	BBB	0.18	-370%	C	0.05	-166%	C	0.05			
Retained Earnings/Assets	0.21%	AAA	0.25	0.75%	AAA	0.25	0.00%	AAA	0.25	0.00%	AAA	0.25	0.00%	AAA	0.25			
Net Worth/Liabilities	6%	NA		2%	NA		-32%	NA		-68%	NA		-71%	NA				
Gross Product Margin	172%	AAA	0.25	171%	AAA	0.25	169%	AAA	0.25	27%	AAA	0.25	21%	AAA	0.25			
Net Profit Margin	4%	AA	0.23	2%	A	0.20	2%	A	0.20	-114%	C	0.05	-50%	C	0.05			
			2.37			2.78			2.63			2.21			2.21			
Sales/Assets	18%			12%			53%			155%			158%					
Retained Earnings				167,280			-			-			-					
Total Assets	37,419			22,254,483			14,871,337			15,817,244			20,225,182					
ALTMAN Z'-Score	0.12	C	0.70	0.44	C	0.70	0.92	C	0.70	-34.24	C	0.70	-26.47	C	0.70			
ALTMAN Z-Score	0.18	C	0.30	0.13	C	0.30	0.53	C	0.30	1.40	C	0.30	1.50	C	0.30			
FINAL RATING	CCC 3.37			CCC 3.78			CCC 3.63			CCC 3.21			CCC 3.21					

Table 24 Credit Rating Calculation of “DARDANEL”

	1992			1993			1994			1995			1996			1997		
	Comparing with			Comparing with			Comparing with			Comparing with			Comparing with			Comparing with		
Liquidity	FS	Percentile	Calculation	FS	Percentile	Calculation	FS	Percentile	Calculation	FS	Percentile	Calculation	FS	Percentile	Calculation	FS	Percentile	Calculation
Current Ratio	75%	C	0.15	82%	C	0.15	185%	AAA	0.75	114%	BBB	0.53	105%	BBB	0.53	106%	BB	0.45
Working Capital Leverage Ratio	-19%	NA		-12%	NA		31%	NA		8%	NA		4%	NA		5%	NA	
Acid Test Ratio	1%	C	0.15	2%	C	0.15	4%	C	0.15	0%	C	0.15	0%	C	0.15	0%	C	0.15
Solvency-Ability To meet key term obligations																		
Interest Coverage	97%	BBB	0.28	96%	A	0.32	71%	C	0.08	49%	BB	0.24	25%	C	0.08	120%	BB	0.24
Leverage and Capital Measure																		
Debt to Assets	86%	AA	0.45	87%	AA	0.45	48%	BB	0.30	69%	A	0.40	77%	AA	0.45	76%	AA	0.45
Long Term Debt to Assets	8%	AA	0.23	18%	AAA	0.25	11%	AAA	0.25	8%	AAA	0.25	4%	AAA	0.25	2%	C	0.05
Profitability																		
Return On Assets	0%	C	0.08	1%	C	0.08	6%	A	0.32	5%	A	0.32	4%	A	0.32	3%	BBB	0.28
Return On Equity	3%	C	0.08	10%	BB	0.24	12%	BBB	0.28	16%	BBB	0.28	17%	A	0.32	11%	BBB	0.28
EBIT/Assets	17%	A	0.20	31%	AAA	0.25	32%	AAA	0.25	17%	A	0.20	9%	BBB	0.18	-9%	C	0.05
Retained Earnings/Assets	0.00%	AAA	0.25	0.23%	AAA	0.25	0.49%	AAA	0.25	0.50%	AAA	0.25	2.89%	AAA	0.25	1.60%	AAA	0.25
Net Worth/Liabilities	16%	NA		15%	NA		108%	NA		45%	NA		30%	NA		32%	NA	
Gross Product Margin	168%	AAA	0.25	153%	AAA	0.25	148%	AAA	0.25	168%	AAA	0.25	184%	AAA	0.25	49%	AAA	0.25
Net Profit Margin	1%	C	0.05	1%	C	0.05	8%	AAA	0.25	7%	AAA	0.25	6%	AAA	0.25	6%	AAA	0.25
			2.17			2.44			3.13			3.12			3.02			2.70
Sales/Assets	85%			100%			83%			73%			61%			48%		
Retained Earnings				1,216			9,745			22,563			226,956			304,907		
Total Assets	269,253			534,887			1,994,212			4,479,354			7,960,670			19,051,652		
ALTMAN Z'-Score	0.07	C	0.70	1.46	BBB	2.45	5.34	AAA	3.50	2.18	BBB	2.45	1.28	BBB	2.45	0.08	C	0.70
ALTMAN Z-Score	0.85	C	0.30	1.01	C	0.30	2.50	BBB	1.05	1.51	C	0.30	1.07	C	0.30	0.38	C	0.30
FINAL RATING	CCC 3.17			BB 5.19			A 7.68			BB 5.87			BB 5.77			CCC 3.70		
	1998			1999			2000			2001			2002					
	Comparing with			Comparing with			Comparing with			Comparing with			Comparing with					
Liquidity	FS	Percentile	Calculation	FS	Percentile	Calculation	FS	Percentile	Calculation	FS	Percentile	Calculation	FS	Percentile	Calculation			
Current Ratio	116%	BBB	0.53	177%	AA	0.68	45%	C	0.15	16%	C	0.15	14%	C	0.15			
Working Capital Leverage Ratio	11%	NA		34%	NA		-84%	NA		-299%	NA		-312%	NA				
Acid Test Ratio	2%	C	0.15	0%	C	0.15	0%	C	0.15	0%	C	0.15	0%	C	0.15			
Solvency-Ability To meet key term obligations																		
Interest Coverage	107%	C	0.08	57%	C	0.08	-372%	C	0.08	-15%	C	0.08	12%	C	0.08			
Leverage and Capital Measure																		
Debt to Assets	74%	AA	0.45	90%	AAA	0.50	187%	AAA	0.50	526%	AAA	0.50	505%	AAA	0.50			
Long Term Debt to Assets	3%	BB	0.15	45%	AAA	0.25	35%	AAA	0.25	169%	AAA	0.25	143%	AAA	0.25			
Profitability																		
Return On Assets	0%	BB	0.24	-9%	C	0.08	-120%	C	0.08	-327%	C	0.08	-83%	C	0.08			
Return On Equity	2%	BB	0.24	-87%	C	0.08	138%	AAA	0.40	77%	AAA	0.40	21%	AA	0.36			
EBIT/Assets	-5%	C	0.05	-30%	C	0.05	-146%	C	0.05	-635%	C	0.05	-176%	C	0.05			
Retained Earnings/Assets	0.09%	AAA	0.25	0.29%	AAA	0.25	0.00%	AAA	0.25	0.00%	AAA	0.25	0.00%	AAA	0.25			
Net Worth/Liabilities	35%	NA		12%	NA		-46%	NA		-81%	NA		-80%	NA				
Gross Product Margin	30%	AAA	0.25	59%	AAA	0.25	-97%	C	0.05	-93%	C	0.05	22%	AAA	0.25			
Net Profit Margin	1%	BBB	0.18	-33%	C	0.05	-221%	C	0.05	-644%	C	0.05	-79%	C	0.05			
			2.56			2.42			2.01			2.01			2.17			
Sales/Assets	34%			27%			54%			51%			105%					
Retained Earnings	37,419			167,280			-			-			-					
Total Assets	40,894,141			57,289,735			41,469,760			33,720,838			42,967,234					
ALTMAN Z'-Score	0.75	C	0.70	0.36	C	0.70	-15.76	C	0.70	-63.17	C	0.70	-33.18	C	0.70			
ALTMAN Z-Score	0.34	C	0.30	0.27	C	0.30	0.48	C	0.30	0.26	C	0.30	0.95	C	0.30			
FINAL RATING	CCC 3.56			CCC 3.42			CCC 3.01			CCC 3.01			CCC 3.17					

Table 25 Credit Rating Calculation of “GÜMÜŞSUYU”

	1992			1993			1994			1995			1996			1997		
	Comparing with			Comparing with			Comparing with			Comparing with			Comparing with			Comparing with		
	FS	Percentile	Calculation	FS	Percentile	Calculation	FS	Percentile	Calculation	FS	Percentile	Calculation	FS	Percentile	Calculation	FS	Percentile	Calculation
Liquidity																		
Current Ratio				138%	AA	0.68	122%	A	0.60	75%	C	0.15	186%	AAA	0.75	147%	AA	0.68
Working Capital Leverage Ratio				20%	NA		10%	NA		-24%	NA		19%	NA		17%	NA	
Acid Test Ratio				35%	C	0.15	15%	C	0.15	0%	C	0.15	1%	C	0.15	1%	C	0.15
Solvency-Ability To meet key term obligations																		
Interest Coverage				76%	BBB	0.28	86%	C	0.08	#DIV/0!	#DIV/0!		-514%	C	0.08	180%	A	0.32
Leverage and Capital Measure																		
Debt to Assets				66%	BBB	0.35	70%	A	0.40	95%	AAA	0.50	25%	C	0.10	40%	C	0.10
Long Term Debt to Assets				14%	AAA	0.25	22%	AAA	0.25	0%	A	0.20	4%	AAA	0.25	4%	BB	0.15
Profitability																		
Return On Assets				6%	A	0.32	5%	A	0.32	5%	A	0.32	9%	AA	0.36	6%	A	0.32
Return On Equity				18%	BBB	0.28	17%	BBB	0.28	100%	AAA	0.40	12%	BBB	0.28	10%	BBB	0.28
EBIT/Assets				33%	AAA	0.25	43%	AAA	0.25	9%	BB	0.15	23%	AA	0.23	0%	C	0.05
Retained Earnings/Assets				0.17%	AAA	0.25	0.55%	AAA	0.25	5875.78%	AAA	0.25	4.03%	AAA	0.25	2.16%	AAA	0.25
Net Worth/Liabilities				52%	NA		43%	NA		5%	NA		297%	NA		150%	NA	
Gross Product Margin				157%	AAA	0.25	153%	AAA	0.25	#DIV/0!	#DIV/0!		160%	AAA	0.25	30%	AAA	0.25
Net Profit Margin				6%	AAA	0.25	5%	A	0.20	#DIV/0!	#DIV/0!		14%	AAA	0.25	8%	AAA	0.25
						3.31			3.03			2.12			2.95			2.80
Sales/Assets				109%			110%			0%			65%			73%		
Retained Earnings				1,216			9,745			22,563			226,956			304,907		
Total Assets				699,463			1,756,493			394			5,633,431			14,119,253		
ALTMAN Z"-Score	#DIV/0!	#DIV/0!	#DIV/0!	4.06	AAA	3.50	4.03	AAA	3.50	190.63	AAA	3.50	6.00	AAA	3.50	2.76	AAA	3.50
ALTMAN Z-Score	#DIV/0!	#DIV/0!	#DIV/0!	1.10	C	0.30	2.69	BBB	1.05	49.89	AAA	1.50	2.77	BBB	1.05	1.51	C	0.30
FINAL RATING																		
A 7.11 A 7.58 A 7.12 A 7.50 BBB 6.60																		
	1998			1999			2000			2001			2002					
	Comparing with			Comparing with			Comparing with			Comparing with			Comparing with					
	FS	Percentile	Calculation	FS	Percentile	Calculation	FS	Percentile	Calculation	FS	Percentile	Calculation	FS	Percentile	Calculation			
Liquidity																		
Current Ratio	116%	BBB	0.53	114%	BBB	0.53	103%	BB	0.45	16%	C	0.15						
Working Capital Leverage Ratio	7%	NA		7%	NA		1%	NA		-57%	NA							
Acid Test Ratio	1%	C	0.15	1%	C	0.15	2%	C	0.15	0%	C	0.15						
Solvency-Ability To meet key term obligations																		
Interest Coverage	79%	C	0.08	41%	C	0.08	31%	C	0.08	-41%	C	0.08						
Leverage and Capital Measure																		
Debt to Assets	56%	BBB	0.35	74%	A	0.40	71%	A	0.40	81%	AA	0.45						
Long Term Debt to Assets	10%	A	0.20	25%	AAA	0.25	18%	AA	0.23	13%	A	0.20						
Profitability																		
Return On Assets	-3%	C	0.08	-18%	C	0.08	-15%	C	0.08	-68%	C	0.08						
Return On Equity	-7%	C	0.08	-70%	C	0.08	-52%	C	0.08	-352%	C	0.08						
EBIT/Assets	-18%	C	0.05	-49%	C	0.05	-38%	C	0.05	-107%	C	0.05						
Retained Earnings/Assets	0.15%	AAA	0.25	0.46%	AAA	0.25	0.00%	AAA	0.25	0.00%	AAA	0.25						
Net Worth/Liabilities	80%	NA		35%	NA		41%	NA		24%	NA							
Gross Product Margin	27%	AA	0.23	31%	AAA	0.25	22%	AAA	0.25	44%	AAA	0.25						
Net Profit Margin	-4%	C	0.05	-24%	C	0.05	-19%	C	0.05	-682%	C	0.05						
			2.04			2.17			2.07			1.79						
Sales/Assets	76%			75%			78%			10%								
Retained Earnings	37,419			167,280			-			-								
Total Assets	24,660,885			36,704,052			44,026,851			77,424,871								
ALTMAN Z"-Score	0.13	C	0.70	-2.44	C	0.70	-2.00	C	0.70	-10.72	C	0.70	#DIV/0!	#DIV/0!	#DIV/0!			
ALTMAN Z-Score	0.76	C	0.30	0.73	C	0.30	0.77	C	0.30	0.06	C	0.30	#DIV/0!	#DIV/0!	#DIV/0!			
FINAL RATING CCC 3.04 CCC 3.17 CCC 3.07 CC 2.79																		

Table 26 Credit Rating Calculation of “KEREVİTAS”

	1992			1993			1994			1995			1996			1997		
	Comparing with			Comparing with			Comparing with			Comparing with			Comparing with			Comparing with		
	FS	Percentile	Calculation	FS	Percentile	Calculation	FS	Percentile	Calculation	FS	Percentile	Calculation	FS	Percentile	Calculation	FS	Percentile	Calculation
Liquidity																		
Current Ratio				98%	C	0.15	130%	A	0.60	137%	A	0.60	117%	A	0.60	125%	A	0.60
Working Capital Leverage Ratio				-2%	NA		19%	NA		20%	NA		12%	NA		17%	NA	
Acid Test Ratio				3%	C	0.15	0%	C	0.15	0%	C	0.15	2%	C	0.15	0%	C	0.15
Solvency-Ability To meet key term obligations																		
Interest Coverage				78%	BBB	0.28	35%	C	0.08	26%	BB	0.24	-29%	C	0.08	-44%	C	0.08
Leverage and Capital Measure																		
Debt to Assets				80%	A	0.40	66%	BBB	0.35	65%	BBB	0.35	79%	AA	0.45	84%	AAA	0.50
Long Term Debt to Assets				1%	AA	0.23	1%	AA	0.23	9%	AAA	0.25	13%	AAA	0.25	16%	A	0.20
Profitability																		
Return On Assets				5%	A	0.32	9%	AA	0.36	9%	AA	0.36	5%	A	0.32	4%	A	0.32
Return On Equity				26%	A	0.32	26%	A	0.32	25%	A	0.32	25%	AA	0.36	23%	AA	0.36
EBIT/Assets				31%	AAA	0.25	28%	AA	0.23	22%	AA	0.23	10%	BBB	0.18	9%	BB	0.15
Retained Earnings/Assets				0.46%	AAA	0.25	0.96%	AAA	0.25	0.79%	AAA	0.25	3.78%	AAA	0.25	2.11%	AAA	0.25
Net Worth/Liabilities				25%	NA		51%	NA		53%	NA		26%	NA		20%	NA	
Gross Product Margin				172%	AAA	0.25	156%	AAA	0.25	159%	AAA	0.25	167%	AAA	0.25	170%	AAA	0.25
Net Profit Margin				5%	AA	0.23	9%	AAA	0.25	11%	AAA	0.25	8%	AAA	0.25	7%	AAA	0.25
				2.82			3.06			3.25			3.14			3.11		
Sales/Assets				114%			97%			81%			63%			58%		
Retained Earnings				1,216			9,745			22,563			226,956			304,907		
Total Assets				267,187			1,013,467			2,851,159			5,967,680			14,444,519		
ALTMAN Z'-Score	#DIV/0!	#DIV/0!	#DIV/0!	2.23	BBB	2.45	3.70	AAA	3.50	3.39	AAA	3.50	1.82	BBB	2.45	1.99	BBB	2.45
ALTMAN Z-Score	#DIV/0!	#DIV/0!	#DIV/0!	1.15	C	0.30	2.19	BBB	1.05	1.87	BBB	1.05	1.17	C	0.30	1.08	C	0.30
FINAL RATING																		
BB 5.57 A 7.61 A 7.80 BB 5.89 BB 5.86																		
	1998			1999			2000			2001			2002					
	Comparing with			Comparing with			Comparing with			Comparing with			Comparing with			Comparing with		
	FS	Percentile	Calculation	FS	Percentile	Calculation	FS	Percentile	Calculation	FS	Percentile	Calculation	FS	Percentile	Calculation	FS	Percentile	Calculation
Liquidity																		
Current Ratio	200%	AAA	0.75	136%	A	0.60	80%	C	0.15	40%	C	0.15	30%	C	0.15			
Working Capital Leverage Ratio	38%	NA		19%	NA		-17%	NA		-94%	NA		-137%	NA				
Acid Test Ratio	1%	C	0.15	0%	C	0.15	0%	C	0.15	1%	C	0.15	1%	C	0.15			
Solvency-Ability To meet key term obligations																		
Interest Coverage	103%	C	0.08	103%	C	0.08	-152%	C	0.08	5%	C	0.08	4%	C	0.08			
Leverage and Capital Measure																		
Debt to Assets	49%	BB	0.30	63%	BBB	0.35	95%	AAA	0.50	172%	AAA	0.50	198%	AAA	0.50			
Long Term Debt to Assets	11%	A	0.20	9%	A	0.20	14%	A	0.20	17%	A	0.20	3%	BB	0.15			
Profitability																		
Return On Assets	0%	BB	0.24	0%	BB	0.24	-38%	C	0.08	-87%	C	0.08	-50%	C	0.08			
Return On Equity	1%	C	0.08	1%	BB	0.24	-767%	C	0.08	121%	AAA	0.40	51%	AAA	0.40			
EBIT/Assets	-13%	C	0.05	-10%	C	0.05	-53%	C	0.05	-179%	C	0.05	-100%	C	0.05			
Retained Earnings/Assets	0.15%	AAA	0.25	0.42%	AAA	0.25	0.00%	AAA	0.25	0.00%	AAA	0.25	0.00%	AAA	0.25			
Net Worth/Liabilities	104%	NA		59%	NA		5%	NA		-42%	NA		-49%	NA				
Gross Product Margin	44%	AAA	0.25	46%	AAA	0.25	28%	AAA	0.25	27%	AAA	0.25	28%	AAA	0.25			
Net Profit Margin	1%	BB	0.15	1%	BBB	0.18	-70%	C	0.05	-150%	C	0.05	-76%	C	0.05			
	2.50			2.59			1.84			2.16			2.11					
Sales/Assets	57%			44%			54%			58%			66%					
Retained Earnings	37,419			167,280			-			-			-					
Total Assets	24,561,092			39,531,888			42,636,110			50,330,968			58,309,003					
ALTMAN Z'-Score	2.66	AAA	3.50	1.22	BBB	2.45	-4.61	C	0.70	-18.61	C	0.70	-16.27	C	0.70			
ALTMAN Z-Score	0.58	C	0.30	0.44	C	0.30	0.52	C	0.30	0.51	C	0.30	0.61	C	0.30			
FINAL RATING																		
BBB 6.30 BB 5.34 CC 2.84 CCC 3.16 CCC 3.11																		

Table 27 Credit Rating Calculation of “KONFRUT”

	1992			1993			1994			1995			1996			1997		
	Comparing with			Comparing with			Comparing with			Comparing with			Comparing with					
Liquidity	FS	Percentile	Calculation	FS	Percentile	Calculation	FS	Percentile	Calculation	FS	Percentile	Calculation	FS	Percentile	Calculation	FS	Percentile	Calculation
Current Ratio				74%	C	0.15	104%	BB	0.45	97%	C	0.15	152%	AA	0.68	129%	A	0.60
Working Capital Leverage Ratio				-16%	NA		2%	NA		-1%	NA		13%	NA		11%	NA	
Acid Test Ratio				10%	C	0.15	3%	C	0.15	0%	C	0.15	0%	C	0.15	2%	C	0.15
Solvency-Ability To meet key term obligations																		
Interest Coverage				-18%	C	0.08	-53%	C	0.08	-130%	C	0.08	-428%	C	0.08	-50%	C	0.08
Leverage and Capital Measure																		
Debt to Assets				64%	BBB	0.35	55%	BBB	0.35	53%	BB	0.30	35%	C	0.10	57%	BB	0.30
Long Term Debt to Assets				3%	AAA	0.25	12%	AAA	0.25	5%	AAA	0.25	10%	AAA	0.25	20%	AA	0.23
Profitability																		
Return On Assets				5%	BBB	0.28	12%	AA	0.36	18%	AAA	0.40	23%	AAA	0.40	6%	AA	0.36
Return On Equity				14%	BB	0.24	26%	A	0.32	37%	AA	0.36	35%	AAA	0.40	14%	A	0.32
EBIT/Assets				10%	BBB	0.18	24%	AA	0.23	29%	AAA	0.25	27%	AAA	0.25	11%	BBB	0.18
Retained Earnings/Assets				1.99%	AAA	0.25	5.01%	AAA	0.25	3.67%	AAA	0.25	17.26%	AAA	0.25	9.31%	AAA	0.25
Net Worth/Liabilities				56%	NA		80%	NA		88%	NA		188%	NA		77%	NA	
Gross Product Margin				185%	AAA	0.25	179%	AAA	0.25	173%	AAA	0.25	174%	AAA	0.25	178%	AAA	0.25
Net Profit Margin				3%	BBB	0.18	8%	AAA	0.25	13%	AAA	0.25	17%	AAA	0.25	7%	AAA	0.25
						2.35			2.94			2.69			3.06			2.96
Sales/Assets				151%			151%			136%			136%			84%		
Retained Earnings				1,216		9,745	9,745			22,563			226,956			304,907		
Total Assets				61,241			194,331			614,418			1,315,130			3,274,833		
ALTMAN Z"-Score	#DIV/0!	#DIV/0!	#DIV/0!	0.28	C	0.70	2.72	AAA	3.50	2.89	AAA	3.50	5.23	AAA	3.50	2.56	BBB	2.45
ALTMAN Z'-Score	#DIV/0!	#DIV/0!	#DIV/0!	1.52	C	0.30	2.64	BBB	1.05	2.65	BBB	1.05	3.24	AAA	1.50	1.67	C	0.30
FINAL RATING				CCC 3.35			A 7.49			A 7.24			AA 8.06			BB 5.71		
	1998			1999			2000			2001			2002					
	Comparing with			Comparing with			Comparing with			Comparing with			Comparing with					
Liquidity	FS	Percentile	Calculation	FS	Percentile	Calculation	FS	Percentile	Calculation	FS	Percentile	Calculation	FS	Percentile	Calculation			
Current Ratio	117%	BBB	0.53	102%	BB	0.45	101%	BB	0.45	85%	C	0.15	80%	C	0.15			
Working Capital Leverage Ratio	6%	NA		1%	NA		0%	NA		-7%	NA		-8%	NA				
Acid Test Ratio	1%	C	0.15	0%	C	0.15	0%	C	0.15	0%	C	0.15	0%	C	0.15			
Solvency-Ability To meet key term obligations																		
Interest Coverage	116%	BB	0.24	100%	C	0.08	-87%	C	0.08	-886%	C	0.08	-61%	C	0.08			
Leverage and Capital Measure																		
Debt to Assets	52%	BB	0.30	50%	BB	0.30	51%	BB	0.30	66%	A	0.40	56%	BBB	0.35			
Long Term Debt to Assets	17%	AA	0.23	13%	A	0.20	11%	A	0.20	20%	AA	0.23	16%	A	0.20			
Profitability																		
Return On Assets	1%	BB	0.24	0%	BB	0.24	-3%	C	0.08	-19%	C	0.08	-11%	C	0.08			
Return On Equity	2%	BB	0.24	0%	C	0.08	-6%	C	0.08	-56%	C	0.08	-24%	C	0.08			
EBIT/Assets	-6%	C	0.05	-12%	C	0.05	-3%	C	0.05	-20%	C	0.05	-15%	C	0.05			
Retained Earnings/Assets	0.66%	AAA	0.25	1.96%	AAA	0.25	0.00%	AAA	0.25	0.00%	AAA	0.25	0.00%	AAA	0.25			
Net Worth/Liabilities	94%	NA		101%	NA		98%	NA		51%	NA		78%	NA				
Gross Product Margin	21%	A	0.20	17%	AA	0.23	4%	C	0.05	-15%	C	0.05	5%	C	0.05			
Net Profit Margin	2%	BBB	0.18	0%	BB	0.15	-5%	C	0.05	-24%	C	0.05	-15%	C	0.05			
			2.60			2.18			1.74			1.57			1.49			
Sales/Assets				70%			60%			78%			69%					
Retained Earnings				37,419		167,280	167,280			-			-					
Total Assets				5,649,929		6,528,891	12,800,488			18,653,928			20,878,065					
ALTMAN Z"-Score	1.02	C	0.70	0.39	C	0.70	0.83	C	0.70	-1.29	C	0.70	-0.73	C	0.70			
ALTMAN Z'-Score	0.70	C	0.30	1.00	C	0.30	0.61	C	0.30	0.78	C	0.30	0.69	C	0.30			
FINAL RATING				CCC 3.60			CCC 3.18			CC 2.74			CC 2.57			CC 2.49		

Table 28 Credit Rating Calculation of “LÜKS KADİFE”

	1992			1993			1994			1995			1996			1997		
	Comparing with			Comparing with			Comparing with			Comparing with			Comparing with			Comparing with		
	FS	Percentile	Calculation	FS	Percentile	Calculation	FS	Percentile	Calculation	FS	Percentile	Calculation	FS	Percentile	Calculation	FS	Percentile	Calculation
Liquidity																		
Current Ratio	140%	A	0.60	157%	AA	0.68	209%	AAA	0.75	204%	AAA	0.75	183%	AAA	0.75	207%	AAA	0.75
Working Capital Leverage Ratio	25%	NA		31%	NA		46%	NA		43%	NA		34%	NA		36%	NA	
Acid Test Ratio	3%	C	0.15	5%	C	0.15	4%	C	0.15	1%	C	0.15	31%	C	0.15	12%	C	0.15
Solvency-Ability To meet key term obligations																		
Interest Coverage	90%	BBB	0.28	65%	BBB	0.28	-115%	C	0.08	-38%	C	0.08	-437%	C	0.08	25955%	AAA	0.40
Leverage and Capital Measure																		
Debt to Assets	69%	BBB	0.35	62%	BB	0.30	50%	BB	0.30	50%	BB	0.30	50%	BB	0.30	49%	C	0.10
Long Term Debt to Assets	7%	AA	0.23	7%	AAA	0.25	7%	AAA	0.25	8%	AAA	0.25	8%	AAA	0.25	15%	A	0.20
Profitability																		
Return On Assets	3%	BBB	0.28	10%	AAA	0.40	29%	AAA	0.40	15%	AAA	0.40	25%	AAA	0.40	26%	AAA	0.40
Return On Equity	10%	BB	0.24	26%	A	0.32	57%	AAA	0.40	30%	AA	0.36	49%	AAA	0.40	50%	AAA	0.40
EBIT/Assets	34%	AAA	0.25	49%	AAA	0.25	62%	AAA	0.25	36%	AAA	0.25	45%	AAA	0.25	34%	AAA	0.25
Retained Earnings/Assets	0.00%	AAA	0.25	1.58%	AAA	0.25	5.70%	AAA	0.25	8.40%	AAA	0.25	37.55%	AAA	0.25	19.58%	AAA	0.25
Net Worth/Liabilities	46%	NA		62%	NA		102%	NA		102%	NA		100%	NA		105%	NA	
Gross Product Margin	163%	AAA	0.25	164%	AAA	0.25	155%	AAA	0.25	164%	AAA	0.25	158%	AAA	0.25	43%	AAA	0.25
Net Profit Margin	2%	BB	0.15	5%	AA	0.23	16%	AAA	0.25	9%	AAA	0.25	16%	AAA	0.25	20%	AAA	0.25
			3.03			3.35			3.33			3.29			3.33			3.40
Sales/Assets	169%			214%			184%			167%			150%			129%		
Retained Earnings				1,216			9,745			22,563			226,956			304,907		
Total Assets	60,868			77,159			171,013			268,488			604,390			1,556,887		
ALTMAN Z'-Score	4.37	AAA	3.50	6.04	AAA	3.50	8.43	AAA	3.50	6.59	AAA	3.50	7.54	AAA	3.50	6.42	AAA	3.50
ALTMAN Z-Score	1.70	C	0.30	2.17	BBB	1.05	4.57	AAA	1.50	3.60	AAA	1.50	3.87	AAA	1.50	3.22	AAA	1.50
FINAL RATING	BBB	6.83		A	7.90		AA	8.33		AA	8.29		AA	8.33		AA	8.40	
	1998			1999			2000			2001			2002					
	Comparing with			Comparing with			Comparing with			Comparing with			Comparing with					
	FS	Percentile	Calculation	FS	Percentile	Calculation	FS	Percentile	Calculation	FS	Percentile	Calculation	FS	Percentile	Calculation			
Liquidity																		
Current Ratio	179%	AA	0.68	166%	AA	0.68	100%	C	0.15	119%	BBB	0.53	281%	AAA	0.75			
Working Capital Leverage Ratio	32%	NA		31%	NA		0%	NA		13%	NA		54%	NA				
Acid Test Ratio	0%	C	0.15	1%	C	0.15	0%	C	0.15	3%	C	0.15	88%	A	0.60			
Solvency-Ability To meet key term obligations																		
Interest Coverage	133%	BBB	0.28	-12%	C	0.08	-89%	C	0.08	36%	C	0.08	303%	A	0.32			
Leverage and Capital Measure																		
Debt to Assets	49%	BB	0.30	71%	A	0.40	79%	AA	0.45	79%	AA	0.45	37%	C	0.10			
Long Term Debt to Assets	9%	BBB	0.18	23%	AA	0.23	8%	BBB	0.18	10%	A	0.20	8%	BBB	0.18			
Profitability																		
Return On Assets	2%	BBB	0.28	-15%	C	0.08	-28%	C	0.08	-37%	C	0.08	29%	AAA	0.40			
Return On Equity	4%	BB	0.24	-51%	C	0.08	-131%	C	0.08	-180%	C	0.08	46%	AAA	0.40			
EBIT/Assets	1%	C	0.05	-28%	C	0.05	-43%	C	0.05	-95%	C	0.05	18%	AA	0.23			
Retained Earnings/Assets	1.68%	AAA	0.25	5.22%	AAA	0.25	0.00%	AAA	0.25	0.00%	AAA	0.25	0.00%	AAA	0.25			
Net Worth/Liabilities	102%	NA		42%	NA		27%	NA		26%	NA		167%	NA				
Gross Product Margin	42%	AAA	0.25	24%	AAA	0.25	14%	AA	0.23	31%	AAA	0.25	34%	AAA	0.25			
Net Profit Margin	2%	A	0.20	-25%	C	0.05	-27%	C	0.05	-22%	C	0.05	15%	AAA	0.25			
			2.85			2.29			1.74			2.17			3.72			
Sales/Assets	88%			61%			103%			169%			196%					
Retained Earnings				167,280			-						-					
Total Assets	37,419			3,203,317			2,685,044			3,612,449			6,816,263					
ALTMAN Z'-Score	3.30	AAA	3.50	0.75	C	0.70	-2.62	C	0.70	-5.25	C	0.70	6.49	AAA	3.50			
ALTMAN Z-Score	0.89	C	0.30	0.60	C	0.30	1.01	C	0.30	1.66	C	0.30	1.98	BBB	1.05			
FINAL RATING	BBB	6.65		CCC	3.29		CC	2.74		CCC	3.17		AA	8.27				

Table 29 Credit Rating Calculation of “MARET”

	1992			1993			1994			1995			1996			1997		
	Comparing with			Comparing with			Comparing with			Comparing with			Comparing with			Comparing with		
	FS	Percentile	Calculation	FS	Percentile	Calculation	FS	Percentile	Calculation	FS	Percentile	Calculation	FS	Percentile	Calculation	FS	Percentile	Calculation
Liquidity																		
Current Ratio	325%	AAA	0.75	232%	AAA	0.75	239%	AAA	0.75	178%	AAA	0.75	186%	AAA	0.75	119%	A	0.60
Working Capital Leverage Ratio	20%	NA		27%	NA		28%	NA		24%	NA		22%	NA		6%	NA	
Acid Test Ratio	2%	C	0.15	1%	C	0.15	11%	C	0.15	1%	C	0.15	0%	C	0.15	1%	C	0.15
Solvency-Ability To meet key term obligations																		
Interest Coverage	703%	AAA	0.40	-4896%	C	0.08	-49875%	C	0.08	-2050%	C	0.08	-8155%	C	0.08	329%	A	0.32
Leverage and Capital Measure																		
Debt to Assets	12%	C	0.10	24%	C	0.10	23%	C	0.10	34%	C	0.10	30%	C	0.10	37%	C	0.10
Long Term Debt to Assets	4%	A	0.20	4%	AAA	0.25	3%	AAA	0.25	3%	AAA	0.25	4%	AAA	0.25	5%	BB	0.15
Profitability																		
Return On Assets	-1%	C	0.08	5%	A	0.32	8%	A	0.32	12%	AAA	0.40	11%	AAA	0.40	6%	A	0.32
Return On Equity	-2%	C	0.08	7%	C	0.08	10%	BB	0.24	18%	BBB	0.28	15%	A	0.32	9%	BBB	0.28
EBIT/Assets	8%	BB	0.15	10%	BBB	0.18	14%	BBB	0.18	20%	A	0.20	18%	A	0.20	7%	BB	0.15
Retained Earnings/Assets	0.00%	AAA	0.25	0.35%	AAA	0.25	1.51%	AAA	0.25	1.56%	AAA	0.25	10.19%	AAA	0.25	7.28%	AAA	0.25
Net Worth/Liabilities	703%	NA		313%	NA		331%	NA		197%	NA		238%	NA		171%	NA	
Gross Product Margin	186%	AAA	0.25	186%	AAA	0.25	186%	AAA	0.25	183%	AAA	0.25	182%	AAA	0.25	13%	BB	0.15
Net Profit Margin	-1%	C	0.05	3%	BB	0.15	4%	A	0.20	6%	AA	0.23	5%	AA	0.23	2%	BBB	0.18
			2.46			2.56			2.77			2.94			2.98			2.65
Sales/Assets	143%			211%			203%			205%			212%			266%		
Retained Earnings				1,216			9,745			22,563			226,956			304,907		
Total Assets	190,586			347,042			644,503			1,448,699			2,228,180			4,190,605		
ALTMAN Z'-Score	9.21	AAA	3.50	5.72	AAA	3.50	6.31	AAA	3.50	5.05	AAA	3.50	5.45	AAA	3.50	2.93	AAA	3.50
ALTMAN Z-Score	1.47	C	0.30	2.13	BBB	1.05	4.06	AAA	1.50	3.69	AAA	1.50	3.91	AAA	1.50	3.71	AAA	1.50
FINAL RATING	BBB 6.26			A 7.11			A 7.77			A 7.94			A 7.98			A 7.65		
	1998			1999			2000			2001			2002					
	Comparing with			Comparing with			Comparing with			Comparing with			Comparing with					
	FS	Percentile	Calculation	FS	Percentile	Calculation	FS	Percentile	Calculation	FS	Percentile	Calculation	FS	Percentile	Calculation			
Liquidity																		
Current Ratio	133%	A	0.60	240%	AAA	0.75	245%	AAA	0.75	152%	A	0.60	99%	C	0.15			
Working Capital Leverage Ratio	10%	NA		29%	NA		27%	NA		15%	NA		0%	NA				
Acid Test Ratio	0%	C	0.15	1%	C	0.15	2%	C	0.15	0%	C	0.15	0%	C	0.15			
Solvency-Ability To meet key term obligations																		
Interest Coverage	143%	A	0.32	160%	A	0.32	1001%	AAA	0.40	-30%	C	0.08	-36%	C	0.08			
Leverage and Capital Measure																		
Debt to Assets	36%	C	0.10	28%	C	0.10	27%	C	0.10	37%	C	0.10	55%	BBB	0.35			
Long Term Debt to Assets	6%	BBB	0.18	7%	BBB	0.18	9%	BBB	0.18	9%	BBB	0.18	8%	BBB	0.18			
Profitability																		
Return On Assets	4%	A	0.32	4%	A	0.32	6%	AA	0.36	-5%	C	0.08	-12%	C	0.08			
Return On Equity	6%	BBB	0.28	6%	BBB	0.28	8%	BBB	0.28	-7%	C	0.08	-27%	C	0.08			
EBIT/Assets	-3%	C	0.05	3%	C	0.05	9%	BBB	0.18	-8%	C	0.05	-21%	C	0.05			
Retained Earnings/Assets	0.54%	AAA	0.25	1.55%	AAA	0.25	0.00%	AAA	0.25	0.00%	AAA	0.25	0.00%	AAA	0.25			
Net Worth/Liabilities	181%	NA		262%	NA		268%	NA		173%	NA		82%	NA				
Gross Product Margin	14%	BBB	0.18	18%	AAA	0.25	16%	AA	0.23	11%	C	0.05	9%	C	0.05			
Net Profit Margin	1%	BBB	0.18	2%	BBB	0.18	2%	A	0.20	-2%	BB	0.15	-5%	C	0.05			
			2.60			2.82			3.07			1.77			1.47			
Sales/Assets	284%			255%			244%			229%			218%					
Retained Earnings				167,280														
Total Assets	37,419			10,803,276			15,731,176			22,512,884			38,003,177					
ALTMAN Z'-Score	2.37	BBB	2.45	4.94	AAA	3.50	5.17	AAA	3.50	2.24	BBB	2.45	-0.57	C	0.70			
ALTMAN Z-Score	2.85	BBB	1.05	2.57	BBB	1.05	2.46	BBB	1.05	2.30	BBB	1.05	2.18	BBB	1.05			
FINAL RATING	BBB 6.10			A 7.37			A 7.62			BB 5.27			CCC 3.22					

Table 30 Credit Rating Calculation of “MEGES”

	1992			1993			1994			1995			1996			1997		
	Comparing with			Comparing with			Comparing with			Comparing with			Comparing with			Comparing with		
	FS	Percentile	Calculation	FS	Percentile	Calculation	FS	Percentile	Calculation	FS	Percentile	Calculation	FS	Percentile	Calculation	FS	Percentile	Calculation
Liquidity																		
Current Ratio							166%	AA	0.68	166%	AAA	0.75	146%	AA	0.68	176%	AAA	0.75
Working Capital Leverage Ratio							29%	NA		32%	NA		25%	NA		33%	NA	
Acid Test Ratio							29%	C	0.15	82%	AA	0.68	8%	C	0.15	6%	C	0.15
Solvency-Ability To meet key term obligations																		
Interest Coverage							27%	C	0.08	76%	BBB	0.28	56%	BBB	0.28	206%	A	0.32
Leverage and Capital Measure																		
Debt to Assets							45%	BB	0.30	54%	BB	0.30	57%	BB	0.30	45%	C	0.10
Long Term Debt to Assets							1%	AA	0.23	6%	AAA	0.25	3%	AAA	0.25	2%	C	0.05
Profitability																		
Return On Assets							13%	AAA	0.40	4%	BBB	0.28	6%	A	0.32	10%	AAA	0.40
Return On Equity							23%	A	0.32	10%	BB	0.24	15%	A	0.32	19%	A	0.32
EBIT/Assets							41%	AAA	0.25	28%	AAA	0.25	30%	AAA	0.25	11%	BB	0.15
Retained Earnings/Assets							8.54%	AAA	0.25	8.61%	AAA	0.25	33.34%	AAA	0.25	19.98%	AAA	0.25
Net Worth/Liabilities							121%	NA		84%	NA		75%	NA		121%	NA	
Gross Product Margin							172%	AAA	0.25	180%	AAA	0.25	154%	AAA	0.25	48%	AAA	0.25
Net Profit Margin							6%	AA	0.23	3%	BBB	0.18	4%	A	0.20	7%	AAA	0.25
									3.13			3.70			3.25			2.99
Sales/Assets							220%			157%			159%			145%		
Retained Earnings							9,745			22,563			226,956			304,907		
Total Assets							114,088			262,032			680,825			1,526,414		
ALTMAN Z'-Score	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	6.27	AAA	3.50	5.10	AAA	3.50	5.50	AAA	3.50	4.79	AAA	3.50
ALTMAN Z-Score	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	4.28	AAA	1.50	3.08	AAA	1.50	3.28	AAA	1.50	2.69	BBB	1.05
FINAL RATING							AA			8.13			AA			8.70		
													AA			8.25		
																A		
																7.54		
	1998			1999			2000			2001			2002					
	Comparing with			Comparing with			Comparing with			Comparing with			Comparing with					
	FS	Percentile	Calculation	FS	Percentile	Calculation	FS	Percentile	Calculation	FS	Percentile	Calculation	FS	Percentile	Calculation			
Liquidity																		
Current Ratio	335%	AAA	0.75	92%	C	0.15	125%	A	0.60	143%	A	0.60	79%	C	0.15			
Working Capital Leverage Ratio	51%	NA		-6%	NA		15%	NA		22%	NA		-21%	NA				
Acid Test Ratio	6%	C	0.15	4%	C	0.15	3%	C	0.15	2%	C	0.15	3%	C	0.15			
Solvency-Ability To meet key term obligations																		
Interest Coverage	-8%	C	0.08	7%	C	0.08	72%	C	0.08	27%	C	0.08	62%	C	0.08			
Leverage and Capital Measure																		
Debt to Assets	68%	A	0.40	100%	AAA	0.50	95%	AAA	0.50	122%	AAA	0.50	101%	AAA	0.50			
Long Term Debt to Assets	47%	AAA	0.25	21%	AA	0.23	35%	AAA	0.25	71%	AAA	0.25	5%	BB	0.15			
Profitability																		
Return On Assets	-30%	C	0.08	-29%	C	0.08	-4%	C	0.08	-51%	C	0.08	-14%	C	0.08			
Return On Equity	-94%	C	0.08	13108%	AAA	0.40	-74%	C	0.08	229%	AAA	0.40	978%	AAA	0.40			
EBIT/Assets	-56%	C	0.05	-60%	C	0.05	-18%	C	0.05	-123%	C	0.05	-53%	C	0.05			
Retained Earnings/Assets	1.73%	AAA	0.25	5.01%	AAA	0.25	0.00%	AAA	0.25	0.00%	AAA	0.25	0.00%	AAA	0.25			
Net Worth/Liabilities	46%	NA		0%	NA		5%	NA		-18%	NA		-1%	NA				
Gross Product Margin	36%	AAA	0.25	39%	AAA	0.25	40%	AAA	0.25	35%	AAA	0.25	38%	AAA	0.25			
Net Profit Margin	-23%	C	0.05	-22%	C	0.05	-3%	C	0.05	-39%	C	0.05	-11%	C	0.05			
			2.39			2.19			2.34			2.66			2.11			
Sales/Assets	130%			131%			130%			131%			130%					
Retained Earnings	37,419			167,280			-			-			-					
Total Assets	2,160,271			3,336,722			5,324,935			6,885,746			11,149,078					
ALTMAN Z'-Score	0.12	C	0.70	-4.30	C	0.70	-0.20	C	0.70	-7.04	C	0.70	-4.96	C	0.70			
ALTMAN Z-Score	1.29	C	0.30	1.29	C	0.30	1.29	C	0.30	1.27	C	0.30	1.28	C	0.30			
FINAL RATING	CCC			CCC			CCC			CCC			CCC			3.11		
	3.39			3.19			3.34			3.66								

Table 31 Credit Rating Calculation of “MERKO”

	1992			1993			1994			1995			1996			1997		
	Comparing with			Comparing with			Comparing with			Comparing with			Comparing with			Comparing with		
	FS	Percentile	Calculation	FS	Percentile	Calculation	FS	Percentile	Calculation	FS	Percentile	Calculation	FS	Percentile	Calculation	FS	Percentile	Calculation
Liquidity																		
Current Ratio	96%	C	0.15	90%	C	0.15	161%	AA	0.68	123%	A	0.60	147%	AA	0.68	124%	A	0.60
Working Capital Leverage Ratio	-3%	NA		-5%	NA		19%	NA		8%	NA		14%	NA		7%	NA	
Acid Test Ratio	1%	C	0.15	1%	C	0.15	4%	C	0.15	1%	C	0.15	3%	C	0.15	1%	C	0.15
Solvency-Ability To meet key term obligations																		
Interest Coverage	-8215%	C	0.08	-9%	C	0.08	-24%	C	0.08	-148%	C	0.08	-100%	C	0.08	148%	BBB	0.28
Leverage and Capital Measure																		
Debt to Assets	83%	A	0.40	74%	BBB	0.35	48%	BB	0.30	54%	BB	0.30	47%	C	0.10	51%	BB	0.30
Long Term Debt to Assets	21%	AAA	0.25	24%	AAA	0.25	16%	AAA	0.25	18%	AAA	0.25	17%	AAA	0.25	19%	AA	0.23
Profitability																		
Return On Assets	3%	BBB	0.28	2%	C	0.08	14%	AAA	0.40	12%	AA	0.36	12%	AAA	0.40	3%	BBB	0.28
Return On Equity	18%	BBB	0.28	8%	C	0.08	26%	A	0.32	26%	A	0.32	22%	A	0.32	7%	BB	0.24
EBIT/Assets	3%	C	0.05	4%	C	0.05	29%	AA	0.23	17%	A	0.20	15%	A	0.20	-4%	C	0.05
Retained Earnings/Assets	0.00%	AAA	0.25	0.46%	AAA	0.25	1.10%	AAA	0.25	1.03%	AAA	0.25	5.34%	AAA	0.25	3.04%	AAA	0.25
Net Worth/Liabilities	21%	NA		35%	NA		110%	NA		84%	NA		114%	NA		97%	NA	
Gross Product Margin	186%	AAA	0.25	184%	AAA	0.25	163%	AAA	0.25	173%	AAA	0.25	174%	AAA	0.25	23%	A	0.20
Net Profit Margin	2%	BBB	0.18	2%	C	0.05	12%	AAA	0.25	14%	AAA	0.25	13%	AAA	0.25	4%	AA	0.23
	2.32			1.74			3.15			3.01			2.93			2.80		
Sales/Assets	139%			131%			112%			87%			94%			72%		
Retained Earnings				1,216			9,745			22,563			226,956			304,907		
Total Assets	154,756			264,126			885,763			2,183,789			4,247,058			10,014,932		
ALTMAN Z'-Score	0.26	C	0.70	0.33	C	0.70	4.40	AAA	3.50	2.59	BBB	2.45	3.32	AAA	3.50	1.37	BBB	2.45
ALTMAN Z-Score	1.39	C	0.30	1.31	C	0.30	2.62	BBB	1.05	1.81	BBB	1.05	2.04	BBB	1.05	1.10	C	0.30
FINAL RATING	CCC 3.32			CC 2.74			A 7.70			BBB 6.51			A 7.48			BB 5.55		
	1998			1999			2000			2001			2002					
	Comparing with			Comparing with			Comparing with			Comparing with			Comparing with					
	FS	Percentile	Calculation	FS	Percentile	Calculation	FS	Percentile	Calculation	FS	Percentile	Calculation	FS	Percentile	Calculation			
Liquidity																		
Current Ratio	109%	BB	0.45	115%	BBB	0.53	90%	C	0.15	62%	C	0.15	66%	C	0.15			
Working Capital Leverage Ratio	4%	NA		6%	NA		-5%	NA		-28%	NA		-21%	NA				
Acid Test Ratio	1%	C	0.15	1%	C	0.15	1%	C	0.15	1%	C	0.15	2%	C	0.15			
Solvency-Ability To meet key term obligations																		
Interest Coverage	173%	A	0.32	391%	AAA	0.40	127%	BB	0.24	-86%	C	0.08	-58%	C	0.08			
Leverage and Capital Measure																		
Debt to Assets	54%	BB	0.30	55%	BB	0.30	64%	BBB	0.35	84%	AA	0.45	74%	AA	0.45			
Long Term Debt to Assets	14%	A	0.20	15%	A	0.20	15%	A	0.20	11%	A	0.20	14%	A	0.20			
Profitability																		
Return On Assets	5%	A	0.32	4%	A	0.32	0%	BB	0.24	-19%	C	0.08	-4%	C	0.08			
Return On Equity	10%	A	0.32	8%	BBB	0.28	1%	C	0.08	-120%	C	0.08	-15%	C	0.08			
EBIT/Assets	-1%	C	0.05	2%	C	0.05	-1%	C	0.05	-28%	C	0.05	-6%	C	0.05			
Retained Earnings/Assets	0.20%	AAA	0.25	0.49%	AAA	0.25	0.00%	AAA	0.25	0.00%	AAA	0.25	0.00%	AAA	0.25			
Net Worth/Liabilities	85%	NA		81%	NA		57%	NA		19%	NA		35%	NA				
Gross Product Margin	25%	AA	0.23	14%	AA	0.23	14%	AA	0.23	18%	AA	0.23	10%	A	0.20			
Net Profit Margin	7%	AAA	0.25	5%	AAA	0.25	1%	BB	0.15	-23%	C	0.05	-5%	C	0.05			
	2.84			2.95			2.09			1.77			1.74					
Sales/Assets	69%			74%			68%			84%			73%					
Retained Earnings				167,280			-			-			-					
Total Assets	37,419			34,197,610			59,028,519			106,144,794			128,389,200					
ALTMAN Z'-Score	1.06	C	0.70	1.40	BBB	2.45	0.19	C	0.70	-3.53	C	0.70	-1.40	C	0.70			
ALTMAN Z-Score	0.70	C	0.30	0.75	C	0.30	0.68	C	0.30	0.83	C	0.30	0.73	C	0.30			
FINAL RATING	CCC 3.84			BB 5.70			CCC 3.09			CC 2.77			CC 2.74					

Table 32 Credit Rating Calculation of “MUDURNU”

	1992			1993			1994			1995			1996			1997														
	Comparing with			Comparing with			Comparing with			Comparing with			Comparing with			Comparing with														
Liquidity	FS	Percentile	Calculation	FS	Percentile	Calculation	FS	Percentile	Calculation	FS	Percentile	Calculation	FS	Percentile	Calculation	FS	Percentile	Calculation												
Current Ratio				96%	C	0.15	96%	C	0.15	101%	BB	0.45	130%	A	0.60	102%	BB	0.45												
Working Capital Leverage Ratio				-3%	NA		-3%	NA		0%	NA		14%	NA		1%	NA													
Acid Test Ratio				3%	C	0.15	7%	C	0.15	11%	C	0.15	3%	C	0.15	3%	C	0.15												
Solvency-Ability To meet key term obligations																														
Interest Coverage				39%	BB	0.24	60%	C	0.08	-327%	C	0.08	#DIV/0!	#DIV/0!		469%	AA	0.36												
Leverage and Capital Measure																														
Debt to Assets				70%	BBB	0.35	72%	A	0.40	49%	BB	0.30	55%	BB	0.30	60%	BBB	0.35												
Long Term Debt to Assets				0%	A	0.20	0%	A	0.20	7%	AAA	0.25	9%	AAA	0.25	9%	A	0.20												
Profitability																														
Return On Assets				7%	A	0.32	3%	BB	0.24	18%	AAA	0.40	10%	AAA	0.40	9%	AAA	0.40												
Return On Equity				22%	A	0.32	10%	BB	0.24	36%	AA	0.36	22%	A	0.32	22%	AA	0.36												
EBIT/Assets				22%	AAA	0.25	9%	BB	0.15	31%	AAA	0.25	12%	BBB	0.18	7%	BB	0.15												
Retained Earnings/Assets				0.67%	AAA	0.25	2.34%	AAA	0.25	2.83%	AAA	0.25	9.03%	AAA	0.25	5.34%	AAA	0.25												
Net Worth/Liabilities				43%	NA		40%	NA		105%	NA		80%	NA		67%	NA													
Gross Product Margin				191%	AAA	0.25	195%	AAA	0.25	187%	AAA	0.25	181%	AAA	0.25	22%	A	0.20												
Net Profit Margin				1%	C	0.05	1%	C	0.05	5%	AA	0.23	7%	AAA	0.25	8%	AAA	0.25												
				2.53			2.16			2.97			2.95			3.12														
Sales/Assets				488%			411%			383%			135%			112%														
Retained Earnings				1,216			9,745			22,563			226,956			304,907														
Total Assets				181,013			415,727			798,037			2,513,431			5,710,715														
ALTMAN Z'-Score	#DIV/0!	#DIV/0!	#DIV/0!	1.76	BBB	2.45	0.94	C	0.70	3.27	AAA	3.50	2.87	AAA	3.50	1.45	BBB	2.45												
ALTMAN Z-Score	#DIV/0!	#DIV/0!	#DIV/0!	4.88	AAA	1.50	4.57	AAA	1.50	5.24	AAA	1.50	2.25	BBB	1.05	1.69	C	0.30												
FINAL RATING																														
	BBB			6.48			B			4.36			A			7.97			A			7.50			BB			5.87		
	1998			1999			2000			2001			2002																	
	Comparing with			Comparing with			Comparing with			Comparing with			Comparing with																	
Liquidity	FS	Percentile	Calculation	FS	Percentile	Calculation	FS	Percentile	Calculation	FS	Percentile	Calculation	FS	Percentile	Calculation	FS	Percentile	Calculation												
Current Ratio	113%	BBB	0.53	106%	BB	0.45	43%	C	0.15	8%	C	0.15																		
Working Capital Leverage Ratio	7%	NA		4%	NA		-69%	NA		-196%	NA																			
Acid Test Ratio	1%	C	0.15	1%	C	0.15	1%	C	0.15	1%	C	0.15																		
Solvency-Ability To meet key term obligations																														
Interest Coverage	318%	AA	0.36	183%	A	0.32	-339%	C	0.08	-1943%	C	0.08																		
Leverage and Capital Measure																														
Debt to Assets	59%	BBB	0.35	77%	AA	0.45	140%	AAA	0.50	247%	AAA	0.50																		
Long Term Debt to Assets	7%	BBB	0.18	12%	A	0.20	19%	AA	0.23	34%	AAA	0.25																		
Profitability																														
Return On Assets	14%	AAA	0.40	2%	BBB	0.28	-69%	C	0.08	-99%	C	0.08																		
Return On Equity	33%	AAA	0.40	10%	A	0.32	170%	AAA	0.40	67%	AAA	0.40																		
EBIT/Assets	8%	BB	0.15	-1%	C	0.05	-87%	C	0.05	-105%	C	0.05																		
Retained Earnings/Assets	0.35%	AAA	0.25	0.66%	AAA	0.25	0.00%	AAA	0.25	0.00%	AAA	0.25																		
Net Worth/Liabilities	70%	NA		30%	NA		-29%	NA		-60%	NA																			
Gross Product Margin	25%	AA	0.23	26%	AAA	0.25	-27%	C	0.05	-132%	C	0.05																		
Net Profit Margin	9%	AAA	0.25	3%	A	0.20	-66%	C	0.05	-655%	C	0.05																		
	3.24			2.92			1.99			2.01																				
Sales/Assets	152%			87%			104%			15%																				
Retained Earnings	37,419			167,280			-			-																				
Total Assets	10,544,375			25,466,958			33,440,372			22,607,529																				
ALTMAN Z'-Score	1.73	BBB	2.45	0.53	C	0.70	-10.67	C	0.70	-20.52	C	0.70	#DIV/0!	#DIV/0!	#DIV/0!															
ALTMAN Z-Score	1.52	C	0.30	0.87	C	0.30	1.00	C	0.30	0.09	C	0.30	#DIV/0!	#DIV/0!	#DIV/0!															
FINAL RATING																														
	BB			5.99			CCC			3.92			CC			2.99			CCC			3.01								

Table 33 Credit Rating Calculation of “RAKS ELK”

	1992			1993			1994			1995			1996			1997		
	Comparing with			Comparing with			Comparing with			Comparing with			Comparing with			Comparing with		
	FS	Percentile	Calculation	FS	Percentile	Calculation	FS	Percentile	Calculation	FS	Percentile	Calculation	FS	Percentile	Calculation	FS	Percentile	Calculation
Liquidity																		
Current Ratio	97%	C	0.15	123%	A	0.60	204%	AAA	0.75	112%	BBB	0.53	134%	A	0.60	148%	AA	0.68
Working Capital Leverage Ratio	-2%	NA		12%	NA		37%	NA		7%	NA		15%	NA		21%	NA	
Acid Test Ratio	1%	C	0.15	5%	C	0.15	3%	C	0.15	9%	C	0.15	0%	C	0.15	6%	C	0.15
Solvency-Ability To meet key term obligations																		
Interest Coverage	74%	BBB	0.28	25%	BB	0.24	63%	C	0.08	-13%	C	0.08	56%	BBB	0.28	67%	C	0.08
Leverage and Capital Measure																		
Debt to Assets	61%	BB	0.30	54%	BB	0.30	47%	BB	0.30	65%	BBB	0.35	63%	BBB	0.35	66%	BBB	0.35
Long Term Debt to Assets	11%	AAA	0.25	2%	AAA	0.25	11%	AAA	0.25	7%	AAA	0.25	18%	AAA	0.25	22%	AA	0.23
Profitability																		
Return On Assets	4%	A	0.32	13%	AAA	0.40	9%	AA	0.36	12%	AAA	0.40	10%	AAA	0.40	7%	AA	0.36
Return On Equity	11%	BB	0.24	29%	AA	0.36	17%	BBB	0.28	34%	AA	0.36	26%	AA	0.36	20%	A	0.32
EBIT/Assets	22%	AA	0.23	31%	AAA	0.25	37%	AAA	0.25	23%	AA	0.23	37%	AAA	0.25	31%	AAA	0.25
Retained Earnings/Assets	0.00%	AAA	0.25	0.14%	AAA	0.25	0.38%	AAA	0.25	0.31%	AAA	0.25	1.72%	AAA	0.25	1.18%	AAA	0.25
Net Worth/Liabilities	65%	NA		86%	NA		115%	NA		55%	NA		60%	NA		51%	NA	
Gross Product Margin	175%	AAA	0.25	166%	AAA	0.25	158%	AAA	0.25	165%	AAA	0.25	158%	AAA	0.25	159%	AAA	0.25
Net Profit Margin	4%	AA	0.23	13%	AAA	0.25	9%	AAA	0.25	17%	AAA	0.25	11%	AAA	0.25	8%	AAA	0.25
			2.64			3.30			3.17			3.09			3.39			3.16
Sales/Assets	106%			101%			98%			73%			92%			80%		
Retained Earnings				1,216			9,745			22,563			226,956			304,907		
Total Assets	434,003			893,253			2,581,868			7,371,019			13,163,060			25,936,651		
ALTMAN Z"-Score	2.06	BBB	2.45	3.80	AAA	3.50	6.13	AAA	3.50	2.62	AAA	3.50	4.18	AAA	3.50	4.01	AAA	3.50
ALTMAN Z-Score	1.07	C	0.30	1.03	C	0.30	2.88	BBB	1.05	1.73	C	0.30	2.45	BBB	1.05	2.13	BBB	1.05
FINAL RATING	BB		5.39	A		7.10	A		7.72	BBB		6.89	A		7.94	A		7.71
	1998			1999			2000			2001			2002					
	Comparing with			Comparing with			Comparing with			Comparing with			Comparing with					
	FS	Percentile	Calculation	FS	Percentile	Calculation	FS	Percentile	Calculation	FS	Percentile	Calculation	FS	Percentile	Calculation			
Liquidity																		
Current Ratio	70%	C	0.15	20%	C	0.15	41%	C	0.15	16%	C	0.15	40%	C	0.15			
Working Capital Leverage Ratio	-15%	NA		-33%	NA		-22%	NA		-78%	NA		-20%	NA				
Acid Test Ratio	7%	C	0.15	1%	C	0.15	1%	C	0.15	0%	C	0.15	0%	C	0.15			
Solvency-Ability To meet key term obligations																		
Interest Coverage	75%	C	0.08	-68%	C	0.08	-28%	C	0.08	-4%	C	0.08	-16%	C	0.08			
Leverage and Capital Measure																		
Debt to Assets	70%	A	0.40	141%	AAA	0.50	150%	AAA	0.50	258%	AAA	0.50	251%	AAA	0.50			
Long Term Debt to Assets	20%	AA	0.23	100%	AAA	0.25	113%	AAA	0.25	165%	AAA	0.25	218%	AAA	0.25			
Profitability																		
Return On Assets	-6%	C	0.08	-94%	C	0.08	-42%	C	0.08	-143%	C	0.08	-52%	C	0.08			
Return On Equity	-19%	C	0.08	230%	AAA	0.40	86%	AAA	0.40	91%	AAA	0.40	34%	AAA	0.40			
EBIT/Assets	-28%	C	0.05	-131%	C	0.05	-65%	C	0.05	-273%	C	0.05	-87%	C	0.05			
Retained Earnings/Assets	0.10%	AAA	0.25	0.48%	AAA	0.25	0.00%	AAA	0.25	0.00%	AAA	0.25	0.00%	AAA	0.25			
Net Worth/Liabilities	43%	NA		-29%	NA		-33%	NA		-61%	NA		-60%	NA				
Gross Product Margin	40%	AAA	0.25	26%	AAA	0.25	18%	AAA	0.25	21%	AAA	0.25	26%	AAA	0.25			
Net Profit Margin	-8%	C	0.05	-220%	C	0.05	-290%	C	0.05	-570%	C	0.05	-342%	C	0.05			
			1.77			2.21			2.21			2.21			2.21			
Sales/Assets	77%			43%			15%			25%			15%					
Retained Earnings	37,419			167,280			-			-			-					
Total Assets	36,680,347			34,504,215			51,185,206			70,975,697			89,226,944					
ALTMAN Z"-Score	-2.37	C	0.70	-11.23	C	0.70	-6.11	C	0.70	-24.11	C	0.70	-7.84	C	0.70			
ALTMAN Z-Score	0.76	C	0.30	0.38	C	0.30	0.12	C	0.30	0.15	C	0.30	0.12	C	0.30			
FINAL RATING	CC		2.77	CCC		3.21	CCC		3.21	CCC		3.21	CCC		3.21			

10 CONCLUSION

The purpose of creating this rating system is to show that the bankruptcy is not a sudden event. The signals of bankruptcy or default of a firm can be determined by using different financial analysis tools. Of course, there is no efficient system than a experienced and skilled credit analyst, but a built rating system also could detect the signals of default at least one year before.

Even if the average sector datas published by “Central Bank of The Republic of Turkey” are efficient for evaluating the financial performance of the firms, are not so popular among credit analysis tools in Turkey. This rating system showed that these datas are important indicators to detect the default probability before a meaningful time period. Unfortunately, in order to be conservative, scores derivated from Altman Z” Discriminant Analysis and Original Altman Z Discriminant Analysis are also used to create final ratings. Since, today, the main Rating Institutions, such as “Moody’s” and “Standard and Poors” compares theirs results reliability with Altman Scores.

In addition to the original score card, two scenarios are discussed with the aim to explore the effects of the changes in the weights of the financial ratios on the rating calculation. According to the scenario A; the weight of liquidity and leverage ratios are decreased, the weight of the solvency and profitability ratios are increased. The ratings which are calculated, for the firms bankrupted, by the scenario A, are higher than the original version. According to the scenario B; the weight of liquidity and leverage ratios are increased, the weight of the solvency and profitability ratios are decreased. The ratings which are calculated, for the firms bankrupted, by the scenario B are approximately same with the original version.

The sample consists of 14 companies which are or were traded in İstanbul Stock Exchange. Two companies went to bankrupt; Gümüşsuyu and Mudurnu. One company; Raks Elk is trading in sub market in IMKB. Two companies; Berdan Teks and Dardanel were taken into the “İSTANBUL YAKLAŞIMI” and their debts to financial institutions were restructured. All these firms’s default signals are detected by this rating system.

An investor who uses this rating system will be aware of the increase in the default probability of a firm and will not buy the stocks of this company or sell these stocks if he already owns.

Financial institutions, which uses their own internal rating system, relate their ratings to the ratings of main Rating Institutions such as “Moody’s” and “Standard and Poors” in order to obtain the default probabilities of each rating. This rating system, indicated an important point, that the rating of the firms which operates in the emergent markets don’t have the same meaning. “BBB” rating for a firm which operates in a developed country may not be an early signal of default, but in the emergent markets, ratings below ‘A’ may be an early signal of default, because, the market conditions, financment possibilities, political environment are more volatile than the developed countries.

Another result obtained from this rating system is to understand that the sector averages of financial datas plays an important role to analyze the crediworthiness. Financial capacities of the firms, located in emergent markets, are limited with the economic conditions of the country. So, if a firm’s financial ratios are below the average value which is obtained from the datas of the market firms, credit analyst should think that this firm’s default probability is higher than the average.

In the case of long term credits, “Mudurnu” is a good example for volatility of ratings. Rating of “Mudurnu” is calculated as “A” for the year 1996; “BB” for the year 1998; “CCC” for the year 1998. The sharp decrease in a short term period, shows that the financial institutions must be very sensitive about the collaterals for the long term credits. Even if the firm’s rating is high, sharp decreases can be happened like “Mudurnu” case.

Finally, we monitored a stable trend for the ratings of healthy firms such as “Arçelik” between the years 1992 and 2002, but we monitor a volatile trend for defaulted companies “Mudurnu” and “Gümüşsuyu” A lot of changes in the ratings should indicate to us that the company’s debt level, profitability and liquidity, are not stable and predictable for the future. The trend analysis of the ratings can give us valuable information about the direction of the firm.

As a result, in this thesis, the effectiveness of a rating system, created by using the industry benchmarks, financial ratios and Altman Z scores, is determined. The evident impact of liquidity ratios, to calculate appropriate rating, is determined among the financial ratios. Besides that, the comparison of financial datas of a firm with sector averages which are published by TCMB, is an effective diagnostic to calculate rating.

APPENDIX 1. Sector Percentiles Published By Central Bank of the Republic of Turkey

D - İMALAT SANAYİİ

STANDART ORANLAR TABLOSU

SQ, Sektör tablosundan hesaplanan oran Q, Sektördeki firmaların oranlarının aritmetik ortalaması																				
Sektördeki firmaların %25' inin oranı Q1'e (Alt Kartil) eşit ya da küçüktür Sektördeki firmaların %50 'sinin oranı Q2'ye (Medyan) eşit ya da küçüktür Sektördeki firmaların %75' inin oranı Q3'e (Üst Kartil) eşit ya da küçüktür						1992					1993					1994				
						SQ	Q	Q1	Q2	Q3	SQ	Q	Q1	Q2	Q3	SQ	Q	Q1	Q2	Q3
A- LİKİDİTE ORANLARI																				
* 1-Cari Oran (%)	121.4	146.0	105.5	121.1	175.9	118.4	133.6	98.1	111.6	160.8	117.9	138.6	97.2	122.2	166.0					
* 2-Likidite (Asit Test) Oranı (%)	67.0	73.8	39.9	75.1	93.8	67.8	73.2	39.8	62.0	96.2	69.0	84.7	33.1	70.5	111.9					
3-Nakit Oranı (%)	13.9	6.5	1.6	4.5	7.3	13.5	6.1	1.1	3.4	7.7	18.9	17.1	1.8	9.9	21.5					
4-Stoklar / Dönen Varlıklar Oranı (%)	41.3	46.7	24.1	50.8	65.2	39.7	48.0	29.6	44.9	67.1	37.7	48.4	27.8	41.2	69.6					
* 5-Stoklar / Aktif Toplamı Oranı (%)	26.1	39.0	19.7	40.9	54.9	25.6	38.5	24.6	34.6	55.4	24.1	38.8	22.8	33.6	57.4					
6-Stok Bağımlılık Oranı (%)	171.8	189.7	71.8	150.1	224.0	184.0	174.8	124.2	176.4	219.4	182.7	146.6	69.8	136.8	220.6					
7-Kısa Vadeli Alacaklar / Dönen Varlıklar Oranı (%)	43.3	42.3	25.0	41.9	59.1	45.5	40.9	22.7	45.3	56.4	41.3	34.1	12.6	32.4	53.4					
* 8-Kısa Vadeli Alacaklar / Aktif Toplamı Oranı (%)	27.4	36.8	22.8	36.6	50.3	29.3	35.1	17.1	36.0	49.6	26.4	28.4	9.7	25.2	45.0					
B- FİNANSAL YAPI ORANLARI																				
1-Yabancı Kaynaklar Toplamı / Aktif Topl. Oranı (%)	66.9	70.7	54.3	76.4	90.6	68.5	71.7	49.6	75.7	90.9	66.1	67.3	49.2	74.0	90.6					
* 2-Öz Kaynaklar / Aktif Toplamı Oranı (%)	33.1	29.7	9.4	23.6	45.7	31.5	30.5	9.1	24.3	50.4	33.9	32.7	9.4	26.0	50.8					
3-Öz Kaynaklar / Yabancı Kaynaklar Top. Oranı (%)	49.4	47.2	9.1	28.7	79.4	45.9	62.2	9.1	30.6	88.7	51.2	48.5	7.3	29.6	82.3					
* 4-Kısa Vadeli Yabancı Kaynaklar / Pasif Top. Oranı (%)	52.1	62.2	43.0	65.5	82.7	54.5	66.8	45.3	70.6	89.3	54.2	64.6	38.4	66.8	87.6					
* 5-Uzun Vadeli Yabancı Kaynaklar / Pasif Top.Oranı (%)	14.9	5.5	0.0	0.0	8.8	14.0	2.3	0.0	0.0	1.1	12.0	1.4	0.0	0.0	0.5					
6-Uzun Vadeli Yab.Kaynaklar / Devamlı Sermaye Oranı (%)	31.0	17.2	0.0	0.0	20.4	30.8	3.0	0.0	0.0	0.0	26.1	0.5	0.0	0.0	0.0					
7-Maddi Duran Varlıklar (Net) / Öz Kaynaklar Oranı (%)	92.6	47.9	16.8	40.8	53.4	94.0	52.7	16.1	37.3	74.4	91.3	41.3	13.8	32.9	58.5					
8-Maddi Duran Varlıkl.(Net) / Uzun Vad. Yab. Kaynaklar Or. (%)	206.0	9.2	0.0	0.0	12.6	211.3	20.3	0.0	0.0	1.2	258.5	489.9	18.8	99.7	764.3					
9-Duran Varlıklar / Yabancı Kaynaklar Toplamı Oranı (%)	54.9	18.2	7.4	12.9	26.7	51.7	24.0	7.9	17.7	30.9	54.6	24.7	7.8	19.6	33.4					
10-Duran Varlıklar / Öz Kaynaklar Oranı (%)	111.2	48.1	18.2	44.6	59.4	112.7	60.1	18.1	38.2	81.4	106.6	42.8	16.3	35.5	67.6					
11-Duran varlıklar / Devamlı Sermaye Oranı (%)	76.7	40.6	14.7	31.5	49.8	78.0	53.8	17.2	33.0	79.4	78.8	43.8	16.9	34.4	67.1					
12-Kısa Vad. Yabancı Kaynakl./ Yabancı Kaynakl. Top.Or. (%)	77.8	90.7	83.7	100.0	100.0	79.6	97.3	98.9	100.0	100.0	81.9	98.7	100.0	100.0	100.0					
13-Banka Kredileri / Aktif Toplamı Oranı (%)	22.0	15.1	0.0	7.6	22.2	24.7	20.8	1.9	14.6	35.4	22.6	8.6	0.0	2.6	8.6					
14-Kısa Vad. Banka Kredileri /Kısa Vad. Yabancı Kaynakl.Or. (%)	30.0	21.5	0.0	9.3	41.2	32.9	28.8	3.6	26.7	42.3	29.4	13.4	0.0	3.5	21.6					
15-Banka Kredileri / Yabancı Kaynaklar Toplamı Oranı (%)	32.9	20.9	0.0	15.2	32.6	36.0	27.9	3.4	26.2	39.2	34.1	12.3	0.0	3.8	18.0					
16-Dönen Varlıklar / Aktif Toplamı oranı (%)	63.2	87.3	82.8	89.8	94.7	64.5	86.3	82.6	88.9	94.8	63.9	81.6	75.8	85.9	93.0					
* 17-Maddi Duran Varlıklar (Net) / Aktif Toplamı Oranı (%)	30.6	12.0	5.0	9.4	16.5	29.6	11.3	4.6	10.2	14.1	30.9	13.8	5.3	9.6	17.9					

APPENDIX 2. Sector Percentiles Published By Central Bank of the Republic of Turkey

D - İMALAT SANAYİİ

STANDART ORANLAR TABLOSU

SQ, Sektör tablosundan hesaplanan oran Q, Sektördeki firmaların oranlarının aritmetik ortalaması															
Sektördeki firmaların %25' inin oranı Q1'e (Alt Kartil) eşit ya da küçüktür Sektördeki firmaların %50 'sinin oranı Q2'ye (Medyan) eşit ya da küçüktür Sektördeki firmaların %75' inin oranı Q3'e (Üst Kartil) eşit ya da küçüktür															
1992					1993					1994					
SQ	Q	Q1	Q2	Q3	SQ	Q	Q1	Q2	Q3	SQ	Q	Q1	Q2	Q3	
C- DEVİR HIZLARI															
* 1-Stok Devir Hızı (Kez)	0.0	4.2	1.1	2.7	6.3	5.0	5.5	2.1	4.0	7.6		5.9	2.2	4.8	8.1
* 2-Alacak Devir Hızı (Kez)	5.0	5.6	2.3	3.8	6.9	4.7	5.9	2.8	4.4	6.6	5.5	10.0	4.5	6.0	11.1
3-Çalışma Sermayesi Devir Hızı (Kez)	2.0	1.9	1.0	1.6	2.5	2.0	2.2	1.1	1.8	2.8	2.1	2.3	1.4	2.1	3.1
4-Net Çalışma Sermayesi Devir Hızı (Kez)	11.2	7.3	1.3	4.7	10.7	12.6	8.9	0.0	4.7	11.9	13.7	7.0	1.5	5.0	14.2
5-Maddi Duran Varlık Devir Hızı (Kez)	4.1	23.0	8.2	14.3	28.7	4.3	21.2	6.8	14.9	26.8	4.3	18.9	7.6	14.6	25.7
6-Duran Varlık Devir Hızı (Kez)	3.4	21.0	7.0	13.8	27.5	3.6	18.1	6.1	12.1	23.8	3.7	14.9	6.2	11.5	18.9
* 7-Öz Kaynaklar Devir Hızı (Kez)	3.8	7.6	2.9	6.0	10.1	4.0	9.4	2.3	5.8	16.1	3.9	8.1	2.9	6.8	10.3
* 8-Aktif Devir Hızı (Kez)	1.3	1.6	0.9	1.3	2.2	1.3	1.6	0.9	1.5	2.2	1.3	1.8	1.1	1.8	2.4
D- KARLILIK ORANLARI															
1-Kar ile Sermaye Arasındaki İlişkileri Gösteren Oranlar															
a)Net Kar (Zarar) / Öz Kaynaklar Oranı (%)	2.8	23.4	7.1	18.8	35.4	7.4	24.6	8.3	20.2	36.7	7.0	22.8	5.2	18.3	39.4
* b)Vergi Öncesi Kar (Zarar) / Öz Kaynaklar Oranı (%)	9.9	35.7	11.9	25.4	49.3	16.0	32.4	13.3	25.1	49.6	18.5	41.9	11.7	33.9	62.8
c)Faiz ve Vergi Öncesi Kar (Zarar) /Pasif T.Oranı (Ekonomik Rantabilite) (%)	12.9	15.2	5.8	13.1	24.2	14.5	14.9	5.7	11.7	20.8	22.3	20.4	7.3	15.3	34.7
d)Net Kar (Zarar) / Aktif Toplamı Oranı (%)	0.9	5.0	1.7	3.3	10.2	2.3	5.8	2.7	5.1	8.7	2.4	6.1	1.2	5.4	12.4
e)Faaliyet Karı (Zararı) / Faaliyetin Gerçekleştirilmesinde Kul.Varlık Oranı (%)	12.9	13.6	3.8	12.1	23.1	14.0	14.8	5.0	11.3	24.4	20.7	19.1	7.4	15.4	30.7
f)Birikmeli (Kümülatif) Karlılık Oranı (%)	3.2	4.1	0.3	1.9	4.7	3.1	3.8	0.4	1.3	3.7	2.6	2.0	0.2	0.9	2.6
2-Kar ile Satışlar Arasındaki İlişkileri Gösteren Oranlar															
* a)Faaliyet Karı (Zararı) / Net Satışlar Oranı (%)	10.0	9.1	2.4	7.0	16.2	10.7	10.2	3.4	6.3	16.1	15.1	11.4	4.4	9.9	16.8
b)Brüt Satış Karı (Zararı) / Net Satışlar Oranı (%)	20.4	24.2	13.1	22.8	33.9	20.9	23.7	11.3	22.4	32.4	24.0	25.6	16.7	24.1	32.7
c)Net Kar (Zarar) / Net Satışlar oranı (%)	0.8	3.8	1.4	2.9	5.2	1.8	3.9	1.7	3.3	5.1	1.8	3.4	1.3	2.8	6.0
d)Satılan Malın Maliyeti / Net Satışlar Oranı (%)	79.6	75.0	66.0	76.6	85.6	79.1	76.3	67.7	77.6	88.7	76.0	74.4	67.3	75.9	83.3
e)Faaliyet Giderleri / Net Satışlar Oranı (%)	10.4	15.1	6.4	13.8	21.2	10.2	15.4	7.4	12.9	20.2	8.9	14.2	7.1	9.9	20.4
f)Faiz Giderleri / Net Satışlar Oranı (%)	7.6	6.4	0.0	2.9	8.4	7.5	4.2	0.0	1.2	7.0	12.0	7.0	0.0	2.2	11.5
3-Kar ile Finansal Yüküm. Arasındaki İlişkileri Gösteren Oranlar															
1-Faiz Ödeme (Karşılama) Oranı															
a)Faiz ve Vergi Öncesi Kar (Zarar) / Faiz Giderleri Oranı (%)	134.3	120.5	0.0	107.7	192.7	153.2	124.5	0.0	84.1	197.2	139.2	253.8	101.9	154.1	378.8
b)Net Kar (Zarar) ve Faiz Giderleri / Faiz Giderleri Oranı (%)	109.8	114.6	0.0	109.1	163.3	124.7	112.3	0.0	95.9	161.3	114.8	193.1	98.2	131.0	313.0
Firma Sayısı :															
3,655					3,655					3,655					

APPENDIX 3. Sector Percentiles Published By Central Bank of the Republic of Turkey

D - İMALAT SANAYİİ

STANDART ORANLAR TABLOSU

SQ, Sektör tablosundan hesaplanan oran Q, Sektördeki firmaların oranlarının aritmetik ortalaması Sektördeki firmaların %25' inin oranı Q1'e (Alt Kartil) eşit ya da küçüktür Sektördeki firmaların %50 'inin oranı Q2'ye (Medyan) eşit ya da küçüktür Sektördeki firmaların %75' inin oranı Q3'e (Üst Kartil) eşit ya da küçüktür	1994					1995					1996				
	SQ	Q	Q1	Q2	Q3	SQ	Q	Q1	Q2	Q3	SQ	Q	Q1	Q2	Q3
A- LİKİDİTE ORANLARI															
* 1-Cari Oran (%)	121.8	142.6	99.4	120.5	169.3	123.3	138.5	98.8	118.2	164.2	120.1	133.1	95.8	114.6	155.5
* 2-Likidite (Asit Test) Oranı (%)	70.7	73.0	34.1	63.1	97.3	69.5	70.3	35.9	60.5	91.5	66.3	65.9	32.8	57.0	87.3
3-Nakit Oranı (%)	19.9	18.4	2.4	9.0	25.7	22.8	16.8	2.3	8.2	23.1	20.2	14.7	1.5	6.4	20.7
4-Stoklar / Dönen Varlıklar Oranı (%)	38.0	45.2	26.2	43.4	64.1	39.4	45.5	27.8	44.0	63.0	40.7	46.5	28.3	45.1	63.7
* 5-Stoklar / Aktif Toplamı Oranı (%)	23.9	33.5	16.9	29.7	47.3	24.9	33.7	17.4	30.2	47.4	25.7	34.1	17.6	30.6	47.7
6-Stok Bağımlılık Oranı (%)	172.8	164.8	74.6	131.8	223.1	158.7	168.2	81.1	136.4	221.4	163.0	171.9	84.8	143.2	227.9
7-Kısa Vadeli Alacaklar / Dönen Varlıklar Oranı (%)	40.4	34.4	15.5	32.4	50.8	36.7	35.3	17.5	33.5	51.3	37.2	35.4	17.6	33.8	51.1
* 8-Kısa Vadeli Alacaklar / Aktif Toplamı Oranı (%)	25.3	25.4	9.8	22.1	37.2	23.1	25.9	11.2	23.1	37.1	23.4	25.6	11.1	22.7	36.4
B- FİNANSAL YAPI ORANLARI															
1-Yabancı Kaynaklar Toplamı / Aktif Topl. Oranı (%)	64.0	63.4	44.2	66.3	83.6	61.7	64.0	45.8	66.0	83.3	63.7	65.7	48.2	68.3	84.4
* 2-Öz Kaynaklar / Aktif Toplamı Oranı (%)	36.0	36.6	16.4	33.7	55.8	38.3	36.5	16.5	33.8	54.1	36.3	34.9	15.4	31.4	51.7
3-Öz Kaynaklar / Yabancı Kaynaklar Top. Oranı (%)	56.3	74.6	17.7	44.9	104.3	62.0	74.9	18.5	47.1	103.4	56.9	66.6	16.9	41.4	90.6
* 4-Kısa Vadeli Yabancı Kaynaklar / Pasif Top. Oranı (%)	51.5	57.1	35.7	57.7	79.1	51.1	58.2	37.6	58.8	79.4	52.4	59.3	38.6	60.8	80.4
* 5-Uzun Vadeli Yabancı Kaynaklar / Pasif Top.Oranı (%)	12.4	1.8	0.0	0.0	1.3	10.6	1.9	0.0	0.0	1.8	11.3	2.5	0.0	0.0	2.0
6-Uzun Vadeli Yab.Kaynaklar / Devamlı Sermaye Oranı (%)	25.7	3.6	0.0	0.0	2.6	21.7	4.4	0.0	0.0	4.3	23.7	6.4	0.0	0.0	5.6
7-Maddi Duran Varlıklar (Net) / Öz Kaynaklar Oranı (%)	88.9	62.8	24.7	52.4	88.0	83.5	65.9	26.7	54.6	90.6	87.0	72.8	26.9	59.6	97.7
8-Maddi Duran Varlıkl.(Net) / Uzun Vad. Yab. Kaynaklar Or. (%)	257.6	718.8	93.9	284.0	884.9	300.5	127.5	0.0	0.0	131.2	279.5	110.7	0.0	0.0	123.3
9-Duran Varlıklar / Yabancı Kaynaklar Toplamı Oranı (%)	58.2	49.7	13.1	32.8	69.1	59.9	48.7	13.7	33.4	67.8	58.1	49.1	13.7	34.3	69.2
10-Duran Varlıklar / Öz Kaynaklar Oranı (%)	103.4	72.7	30.9	61.4	98.9	96.6	76.2	33.1	63.6	102.8	102.0	84.3	33.6	68.5	111.7
11-Duran varlıklar / Devamlı Sermaye Oranı (%)	76.8	63.7	27.3	54.6	87.5	75.6	66.3	29.6	57.2	90.4	77.8	70.8	30.4	60.6	95.1
12-Kısa Vad. Yabancı Kaynakl./ Yabancı Kaynakl. Top.Or. (%)	80.6	96.3	97.2	100.0	100.0	82.8	95.9	96.1	100.0	100.0	82.3	95.3	95.7	100.0	100.0
13-Banka Kredileri / Aktif Toplamı Oranı (%)	21.8	10.6	0.0	2.2	16.3	21.2	16.2	0.0	7.1	26.4	24.8	21.8	0.4	14.1	36.2
14-Kısa Vad. Banka Kredileri /Kısa Vad. Yabancı Kaynakl.Or. (%)	28.5	15.5	0.0	2.1	24.2	29.1	21.6	0.0	9.8	38.4	33.0	27.9	0.0	19.3	50.2
15-Banka Kredileri / Yabancı Kaynaklar Toplamı Oranı (%)	34.1	17.6	0.0	4.7	29.0	34.4	23.4	0.0	12.6	41.6	38.8	30.2	0.8	23.1	52.9
16-Dönen Varlıklar / Aktif Toplamı oranı (%)	62.8	73.1	60.9	78.4	90.2	63.0	73.0	61.0	77.6	89.8	63.0	72.1	59.0	76.6	89.4
* 17-Maddi Duran Varlıklar (Net) / Aktif Toplamı Oranı (%)	32.0	23.8	7.7	18.3	34.8	32.0	23.6	8.1	18.9	34.5	31.6	24.5	8.2	19.7	36.2

D - İMALAT SANAYİİ
STANDART ORANLAR TABLOSU

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APPENDIX 5. Sector Percentiles Published By Central Bank of the Republic of Turkey

D - İMALAT SANAYİİ

STANDART ORANLAR TABLOSU

SQ, Sektör tablosundan hesaplanan oran Q, Sektördeki firmaların oranlarının aritmetik ortalaması Sektördeki firmaların %25' inin oranı Q1'e (Alt Kartil) eşit ya da küçüktür Sektördeki firmaların %50 'sinin oranı Q2'ye (Medyan) eşit ya da küçüktür Sektördeki firmaların %75' inin oranı Q3'e (Üst Kartil) eşit ya da küçüktür	1997					1998					1999				
	SQ	Q	Q1	Q2	Q3	SQ	Q	Q1	Q2	Q3	SQ	Q	Q1	Q2	Q3
A- LİKİDİTE ORANLARI															
* 1-Cari Oran (%)	126.5	130.9	97.3	116.1	162.7	125.9	143.5	98.5	121.7	183.0	122.6	138.6	98.0	120.7	178.8
* 2-Likidite (Asit Test) Oranı (%)	70.9	68.3	37.3	60.3	93.7	71.5	79.3	41.8	66.6	107.9	73.0	78.8	41.9	67.8	108.4
3-Nakit Oranı (%)	22.6	16.0	2.1	7.4	26.5	22.3	20.9	2.2	10.2	34.6	23.6	19.5	2.3	9.2	33.1
4-Stoklar / Dönen Varlıklar Oranı (%)	39.9	45.3	28.5	43.7	60.4	39.2	43.0	25.7	40.8	58.6	35.8	41.2	23.4	38.7	56.4
* 5-Stoklar / Aktif Toplamı Oranı (%)	24.2	31.7	16.6	28.3	43.4	23.0	29.8	15.0	25.7	41.1	21.4	29.2	14.2	25.2	40.1
6-Stok Bağlımlılık Oranı (%)	153.2	182.7	95.5	153.3	260.8	157.4	175.7	86.8	143.9	268.1	174.0	192.8	87.4	151.7	293.7
7-Kısa Vadeli Alacaklar / Dönen Varlıklar Oranı (%)	37.4	37.9	21.7	36.6	52.7	37.6	38.7	21.9	37.0	53.8	38.6	40.3	23.2	39.2	56.1
* 8-Kısa Vadeli Alacaklar / Aktif Toplamı Oranı (%)	22.7	26.1	12.8	23.5	36.7	22.0	26.4	13.1	23.2	36.3	23.1	27.8	13.8	25.0	38.6
B- FİNANSAL YAPI ORANLARI															
1-Yabancı Kaynaklar Toplamı / Aktif Topl. Oranı (%)	63.2	65.6	49.5	68.1	83.2	61.7	62.7	44.6	64.0	81.7	65.1	64.4	46.5	65.2	83.3
* 2-Öz Kaynaklar / Aktif Toplamı Oranı (%)	36.8	36.2	18.3	32.8	51.6	38.3	39.8	21.0	37.7	56.7	34.9	39.4	20.5	36.7	55.7
3-Öz Kaynaklar / Yabancı Kaynaklar Top. Oranı (%)	58.3	70.2	22.4	46.4	106.4	62.2	86.4	26.5	55.9	131.0	53.6	81.9	25.8	54.1	125.8
* 4-Kısa Vadeli Yabancı Kaynaklar / Pasif Top. Oranı (%)	48.0	57.0	37.9	57.4	76.7	46.5	53.8	33.2	52.7	74.2	48.7	55.7	34.7	54.9	75.5
* 5-Uzun Vadeli Yabancı Kaynaklar / Pasif Top.Oranı (%)	15.2	15.6	2.1	8.8	24.7	15.1	15.2	1.9	9.0	23.2	16.4	15.4	2.1	8.7	24.3
6-Uzun Vadeli Yab.Kaynaklar / Devamlı Sermaye Oranı (%)	29.3	29.4	5.2	20.2	48.2	28.3	28.0	5.2	19.9	45.3	31.9	29.2	6.0	19.6	46.9
7-Maddi Duran Varlıklar (Net) / Öz Kaynaklar Oranı (%)	89.1	85.5	42.4	69.0	119.9	89.1	78.6	36.7	65.5	111.2	94.2	72.6	34.9	60.5	104.6
8-Maddi Duran Varlıkl.(Net) / Uzun Vad. Yab. Kaynaklar Or. (%)	215.3	554.3	124.3	222.3	1,192.5	226.2	598.4	126.9	243.1	1,288.6	200.8	484.1	111.2	225.3	1,076.2
9-Duran Varlıklar / Yabancı Kaynaklar Toplamı Oranı (%)	62.2	55.9	19.4	42.3	82.2	67.2	62.2	20.4	45.3	90.5	61.8	55.5	18.6	40.5	83.7
10-Duran Varlıklar / Öz Kaynaklar Oranı (%)	106.8	97.7	50.6	79.7	138.0	108.0	90.1	45.3	74.3	127.1	115.3	85.3	43.3	70.4	121.5
11-Duran varlıklar / Devamlı Sermaye Oranı (%)	75.5	75.5	43.7	67.7	102.7	77.5	71.7	38.2	64.5	97.7	78.5	68.8	36.4	61.3	95.3
12-Kısa Vad. Yabancı Kaynakl./ Yabancı Kaynakl. Top.Or. (%)	75.9	88.6	81.0	99.7	100.0	75.5	87.4	79.1	99.4	100.0	74.9	88.5	81.0	99.6	100.0
13-Banka Kredileri / Aktif Toplamı Oranı (%)	27.1	29.4	9.7	25.3	45.3	27.8	28.2	9.2	24.5	43.6	29.5	28.3	8.7	23.6	42.8
14-Kısa Vad. Banka Kredileri /Kısa Vad. Yabancı Kaynakl.Or. (%)	35.4	39.1	14.8	37.6	60.5	38.7	38.4	14.6	36.1	59.6	38.9	37.0	13.6	34.2	56.7
15-Banka Kredileri / Yabancı Kaynaklar Toplamı Oranı (%)	42.9	40.9	16.6	39.9	63.0	45.0	40.7	16.9	39.8	62.5	45.3	39.7	15.8	38.4	61.0
16-Dönen Varlıklar / Aktif Toplamı oranı (%)	60.7	68.7	54.6	71.8	85.5	58.6	68.2	54.0	71.7	85.3	59.8	69.4	56.1	73.3	86.4
* 17-Maddi Duran Varlıklar (Net) / Aktif Toplamı Oranı (%)	32.8	27.8	11.3	24.4	41.3	34.2	27.9	11.7	24.2	40.9	32.9	26.6	10.7	22.4	38.8

APPENDIX 6. Sector Percentiles Published By Central Bank of the Republic of Turkey

D - İMALAT SANAYİİ

STANDART ORANLAR TABLOSU

SQ, Sektör tablosundan hesaplanan oran Q, Sektördeki firmaların oranlarının aritmetik ortalaması Sektördeki firmaların %25' inin oranı Q1'e (Alt Kartil) eşit ya da küçüktür Sektördeki firmaların %50 'inin oranı Q2'ye (Medyan) eşit ya da küçüktür Sektördeki firmaların %75' inin oranı Q3'e (Üst Kartil) eşit ya da küçüktür	1997					1998					1999				
	SQ	Q	Q1	Q2	Q3	SQ	Q	Q1	Q2	Q3	SQ	Q	Q1	Q2	Q3
C- DEVİR HIZLARI															
* 1-Stok Devir Hızı (Kez)	0.0	7.1	3.3	5.5	9.9	4.9	7.0	3.2	5.4	10.0	4.7	6.6	3.0	5.2	9.3
* 2-Alacak Devir Hızı (Kez)	5.8	8.3	4.2	6.2	12.2	5.7	8.3	4.3	6.4	12.1	5.2	7.6	3.9	5.7	11.2
3-Çalışma Sermayesi Devir Hızı (Kez)	2.0	2.4	1.5	2.1	3.1	2.0	2.4	1.5	2.2	3.1	1.8	2.3	1.4	2.0	3.0
4-Net Çalışma Sermayesi Devir Hızı (Kez)	9.6	11.7	4.3	7.5	18.4	9.5	10.3	3.8	6.5	16.3	9.6	9.4	3.6	6.2	14.8
5-Maddi Duran Varlık Devir Hızı (Kez)	3.7	10.0	3.0	5.8	16.2	3.4	9.6	3.0	5.6	15.5	3.2	9.7	3.0	5.6	16.2
6-Duran Varlık Devir Hızı (Kez)	3.1	8.4	2.6	5.1	13.0	2.8	8.0	2.6	4.9	12.6	2.6	8.1	2.5	5.0	13.1
* 7-Öz Kaynaklar Devir Hızı (Kez)	3.3	6.3	2.5	4.3	9.4	3.0	5.5	2.2	3.8	8.2	3.0	5.4	2.2	3.7	8.1
* 8-Aktif Devir Hızı (Kez)	1.2	1.6	1.0	1.4	2.1	1.1	1.6	1.0	1.4	2.1	1.1	1.5	0.9	1.3	2.0
D- KARLILIK ORANLARI															
1-Kar ile Sermaye Arasındaki İlişkileri Gösteren Oranlar															
a)Net Kar / Öz Kaynaklar Oranı (%)	15.5	17.0	3.8	14.1	28.3	9.2	12.6	1.5	9.8	22.8	1.7	11.5	0.6	9.2	22.3
* b)Vergi Öncesi Kar / Öz Kaynaklar Oranı (%)	24.7	26.7	6.6	21.2	43.3	16.0	20.0	3.2	15.0	34.3	7.8	15.9	1.2	12.3	30.2
c)Faiz ve Vergi Öncesi Kar /Pasif T.Oranı (%)	19.1	18.1	7.2	15.0	25.8	16.9	18.2	7.0	15.4	26.3	14.8	17.2	6.9	14.5	24.4
d)Net Kar / Aktif Toplamı Oranı (%)	5.7	4.9	0.7	3.5	8.7	3.5	3.8	0.2	2.8	7.8	0.6	3.0	(1.5)	2.5	7.1
e)Faal.Kar / Faal. Gerçekleştirilmesinde Kul.Varlık Or.(%)	15.7	14.3	4.2	12.3	22.7	13.1	13.3	3.2	11.5	22.3	9.7	10.6	1.4	9.3	19.1
f)Birikmeli (Kümülatif) Karlılık Oranı (%)	3.3	2.8	0.3	1.2	4.4	3.9	3.0	0.3	1.2	5.0	4.0	3.2	0.4	1.3	5.1
2-Kar ile Satışlar Arasındaki İlişkileri Gösteren Oranlar															
* a)Faaliyet Karı / Net Satışlar Oranı (%)	12.3	9.5	2.9	8.2	15.0	10.8	8.7	2.1	7.6	14.9	8.7	7.0	1.1	6.5	13.1
b)Brüt Satış Karı / Net Satışlar Oranı (%)	22.0	19.6	9.9	17.8	27.6	21.6	19.4	9.3	17.9	28.2	20.5	18.7	9.4	17.7	27.4
c)Net Kar / Net Satışlar oranı (%)	4.7	3.3	0.5	2.4	5.7	3.1	2.7	0.2	1.9	5.0	0.6	2.2	(1.1)	1.8	4.6
d)Satılan Malın Maliyeti / Net Satışlar Oranı (%)	78.0	80.4	72.4	82.2	90.1	78.4	80.7	71.9	82.2	90.8	79.5	81.3	72.7	82.4	90.6
e)Faaliyet Giderleri / Net Satışlar Oranı (%)	9.7	9.9	4.6	8.0	13.7	10.8	10.8	5.0	8.7	14.9	11.8	12.1	5.8	9.9	16.8
f)Faiz Giderleri / Net Satışlar Oranı (%)	8.3	7.9	1.3	5.0	12.2	9.4	8.9	1.7	6.1	13.9	11.4	9.5	1.7	6.3	14.9
3-Kar ile Finansal Yüküm. Arasındaki İlişkileri Gösteren Oranlar															
1-Faiz Ödeme (Karşılama) Oranı															
a)Faiz ve Vergi Öncesi Kar / Faiz Giderleri Oranı (%)	190.7	300.9	119.0	158.9	581.0	156.6	230.7	110.4	141.5	418.0	122.3	213.7	106.8	133.0	388.3
b)Net Kar ve Faiz Giderleri / Faiz Giderleri Oranı (%)	156.6	233.9	110.6	138.0	434.2	132.6	185.7	105.4	126.6	305.5	104.9	179.5	103.8	123.4	306.6

APPENDIX 7. Sector Percentiles Published By Central Bank of the Republic of Turkey

D - İMALAT SANAYİİ

STANDART ORANLAR TABLOSU

SQ, Sektör tablosundan hesaplanan oran Q, Sektördeki firmaların oranlarının aritmetik ortalaması Sektördeki firmaların %25' inin oranı Q1'e (Alt Kartil) eşit ya da küçüktür Sektördeki firmaların %50' sinin oranı Q2'ye (Medyan) eşit ya da küçüktür Sektördeki firmaların %75' inin oranı Q3'e (Üst Kartil) eşit ya da küçüktür	1999					2000					2001				
	SQ	Q	Q1	Q2	Q3	SQ	Q	Q1	Q2	Q3	SQ	Q	Q1	Q2	Q3
A- LİKİDİTE ORANLARI															
* 1-Cari Oran (%)	124.3	141.1	99.5	121.7	180.4	127.7	140.1	100.6	122.6	177.6	120.3	146.8	100.7	124.0	196.2
* 2-Likidite (Asit Test) Oranı (%)	74.6	80.0	42.4	69.0	108.7	75.9	78.0	42.3	68.0	106.5	72.7	80.3	38.1	65.7	115.7
3-Nakit Oranı (%)	24.5	20.0	2.6	10.0	33.6	21.5	18.8	2.1	8.8	31.3	20.8	17.6	1.9	7.8	30.1
4-Stoklar / Dönen Varlıklar Oranı (%)	35.5	41.3	23.5	38.7	56.6	36.5	42.2	24.5	39.8	57.6	35.0	43.1	23.4	40.3	60.6
* 5-Stoklar / Aktif Toplamı Oranı (%)	21.3	29.2	14.5	25.2	39.8	22.3	30.0	15.2	26.6	41.6	20.8	31.3	15.0	27.1	44.6
6-Stok Bağımlılık Oranı (%)	171.2	189.4	86.5	149.9	289.2	168.3	179.4	87.1	148.3	273.6	188.3	185.9	82.2	144.6	289.7
7-Kısa Vadeli Alacaklar / Dönen Varlıklar Oranı (%)	38.4	40.4	23.6	39.4	55.9	41.4	40.4	23.5	39.5	55.9	41.5	40.5	23.3	38.9	57.1
* 8-Kısa Vadeli Alacaklar / Aktif Toplamı Oranı (%)	23.1	28.0	14.1	25.3	39.0	25.3	28.1	14.5	25.3	39.5	24.7	29.1	14.4	26.3	40.9
B- FİNANSAL YAPI ORANLARI															
1-Yabancı Kaynaklar Toplamı / Aktif Topl. Oranı (%)	64.8	63.7	46.4	64.8	82.3	63.0	63.5	46.3	64.6	81.6	68.9	64.9	44.6	65.1	84.7
* 2-Öz Kaynaklar / Aktif Toplamı Oranı (%)	35.2	39.3	20.5	36.6	55.3	37.0	39.5	21.6	36.7	55.2	31.1	40.7	21.3	37.9	58.1
3-Öz Kaynaklar / Yabancı Kaynaklar Top. Oranı (%)	54.4	81.2	25.8	54.2	123.8	58.7	82.1	27.5	54.8	123.1	45.2	88.4	27.1	56.3	138.6
* 4-Kısa Vadeli Yabancı Kaynaklar / Pasif Top. Oranı (%)	48.4	55.1	34.4	54.6	75.2	47.7	55.3	35.1	55.0	74.6	49.5	55.9	34.0	54.4	76.3
* 5-Uzun Vadeli Yabancı Kaynaklar / Pasif Top.Oranı (%)	16.4	15.9	2.3	8.9	25.2	15.3	14.3	2.4	8.9	22.6	19.4	17.2	1.9	9.6	26.2
6-Uzun Vadeli Yab. Kaynaklar / Devamlı Sermaye Oranı (%)	31.8	29.6	6.1	20.0	46.9	29.3	28.3	6.1	20.0	43.8	38.4	32.3	5.1	20.7	53.3
7-Maddi Duran Varlıklar (Net) / Öz Kaynaklar Oranı (%)	93.1	73.7	35.5	60.6	107.0	86.6	71.4	36.4	59.8	101.8	105.6	65.1	29.3	52.9	94.9
8-Maddi Duran Varlıkl.(Net) / Uzun Vad. Yab. Kaynaklar Or. (%)	199.7	463.3	111.6	224.7	993.0	209.4	502.0	114.4	238.8	1,041.5	169.3	481.3	96.6	199.6	1,135.7
9-Duran Varlıklar / Yabancı Kaynaklar Toplamı Oranı (%)	61.6	56.0	18.9	41.0	83.5	62.0	55.4	18.9	41.1	81.8	58.8	51.5	15.2	36.6	78.6
10-Duran Varlıklar / Öz Kaynaklar Oranı (%)	113.2	84.6	43.4	69.7	121.3	105.6	82.2	43.1	69.1	116.2	130.1	74.4	35.3	59.8	107.9
11-Duran varlıklar / Devamlı Sermaye Oranı (%)	77.2	68.7	37.0	60.7	95.2	74.7	67.5	37.5	59.9	93.3	80.1	61.5	30.4	52.9	88.6
12-Kısa Vad. Yabancı Kaynakl./ Yabancı Kaynakl. Top.Or. (%)	74.7	88.8	81.3	99.9	100.0	75.7	88.6	80.8	99.6	100.0	71.8	90.2	82.6	100.0	100.0
13-Banka Kredileri / Aktif Toplamı Oranı (%)	28.9	26.7	8.2	22.0	40.1	26.6	26.0	8.3	21.3	39.0	31.3	23.1	4.3	15.5	36.2
14-Kısa Vad. Banka Kredileri /Kısa Vad. Yabancı Kaynakl.Or. (%)	37.9	35.6	12.4	32.4	54.7	35.5	35.4	11.8	32.2	55.7	36.7	29.2	5.4	21.4	48.4
15-Banka Kredileri / Yabancı Kaynaklar Toplamı Oranı (%)	44.7	38.6	14.9	36.2	59.3	42.3	38.1	14.7	36.2	58.4	45.4	32.4	7.7	26.3	53.8
16-Dönen Varlıklar / Aktif Toplamı oranı (%)	60.1	69.6	56.4	73.7	86.5	60.9	70.1	57.7	73.4	86.2	59.5	71.7	59.3	76.2	88.5
* 17-Maddi Duran Varlıklar (Net) / Aktif Toplamı Oranı (%)	32.8	26.8	10.9	22.5	39.0	32.0	26.2	11.0	22.5	37.3	32.9	24.8	9.1	20.2	35.4

APPENDIX 8. Sector Percentiles Published By Central Bank of the Republic of Turkey

D - İMALAT SANAYİİ

STANDART ORANLAR TABLOSU

SQ, Sektör tablosundan hesaplanan oran Q, Sektördeki firmaların oranlarının aritmetik ortalaması Sektördeki firmaların %25' inin oranı Q1'e (Alt Kartil) eşit ya da küçüktür Sektördeki firmaların %50 'sinin oranı Q2'ye (Medyan) eşit ya da küçüktür Sektördeki firmaların %75' inin oranı Q3'e (Üst Kartil) eşit ya da küçüktür						1999					2000					2001				
SQ	Q	Q1	Q2	Q3		SQ	Q	Q1	Q2	Q3	SQ	Q	Q1	Q2	Q3	SQ	Q	Q1	Q2	Q3
C- DEVİR HIZLARI																				
* 1-Stok Devir Hızı (Kez)	0.0	6.8	3.2	5.3	9.5	5.3	7.1	3.2	5.6	10.2	5.3	7.0	2.9	5.3	10.0					
* 2-Alacak Devir Hızı (Kez)	5.1	7.5	4.0	5.7	11.1	5.3	7.5	4.1	6.1	10.7	5.4	7.7	4.1	6.0	11.3					
3-Çalışma Sermayesi Devir Hızı (Kez)	1.8	2.3	1.5	2.1	3.0	1.9	2.4	1.5	2.1	3.1	1.9	2.4	1.5	2.2	3.2					
4-Net Çalışma Sermayesi Devir Hızı (Kez)	9.0	9.7	3.6	6.3	15.9	9.0	10.0	3.8	6.5	15.5	11.5	9.9	3.5	6.3	15.9					
5-Maddi Duran Varlık Devir Hızı (Kez)	3.2	9.9	3.1	5.8	16.2	3.7	10.3	3.3	6.2	16.5	3.5	12.6	3.6	7.1	20.6					
6-Duran Varlık Devir Hızı (Kez)	2.7	8.5	2.6	5.2	13.5	3.0	8.6	2.8	5.4	13.6	2.9	10.5	3.1	6.2	16.8					
* 7-Öz Kaynaklar Devir Hızı (Kez)	3.0	5.6	2.2	3.8	8.3	3.2	5.5	2.3	3.9	8.0	3.7	5.8	2.3	4.0	8.5					
* 8-Aktif Devir Hızı (Kez)	1.1	1.6	0.9	1.4	2.1	1.2	1.6	1.0	1.4	2.1	1.2	1.7	1.0	1.5	2.3					
D- KARLILIK ORANLARI																				
1-Kar ile Sermaye Arasındaki İlişkileri Gösteren Oranlar																				
a)Net Kar / Öz Kaynaklar Oranı (%)	3.5	12.2	1.0	9.7	23.0	6.5	12.5	1.7	10.0	22.0	0.0	12.4	(0.8)	9.0	24.1					
* b)Vergi Öncesi Kar / Öz Kaynaklar Oranı (%)	9.6	17.0	1.9	13.4	31.5	12.4	17.4	2.8	13.8	30.2	0.0	17.5	0.2	12.3	33.7					
c)Faiz ve Vergi Öncesi Kar /Pasif T.Oranı (%)	15.1	16.9	6.9	14.2	24.0	11.5	13.4	5.5	11.2	18.9	17.5	20.4	6.7	15.8	29.6					
d)Net Kar / Aktif Toplamı Oranı (%)	1.2	3.4	(0.1)	2.7	7.4	2.4	3.7	0.2	2.8	7.3	0.0	2.7	(3.3)	2.2	7.7					
e)Faal.Kar / Faal. Gerçekleştirilmesinde Kul.Varlık Or.(%)	9.9	11.0	2.0	9.5	19.6	8.9	9.1	1.8	8.1	16.0	12.5	14.1	1.8	11.1	24.9					
f)Birikmeli (Kümülatif) Karlılık Oranı (%)	4.0	3.2	0.4	1.3	5.2	4.1	3.3	0.3	1.3	5.3	3.9	2.9	0.3	1.1	4.9					
2-Kar ile Satışlar Arasındaki İlişkileri Gösteren Oranlar																				
* a)Faaliyet Karı / Net Satışlar Oranı (%)	8.8	7.3	1.5	6.5	12.9	7.2	6.1	1.3	5.5	10.2	10.3	8.4	1.4	7.3	14.9					
b)Brüt Satış Karı / Net Satışlar Oranı (%)	20.5	19.0	9.7	17.8	27.2	18.5	17.8	9.5	16.2	24.9	21.0	20.2	10.7	19.0	29.2					
c)Net Kar / Net Satışlar oranı (%)	1.2	2.4	0.0	1.9	4.8	2.0	2.6	0.2	2.0	4.8	0.0	1.7	(2.4)	1.5	4.4					
d)Satılan Malın Maliyeti / Net Satışlar Oranı (%)	79.5	81.0	72.8	82.2	90.3	81.5	82.2	75.2	83.8	90.5	79.0	79.9	70.9	81.1	89.4					
e)Faaliyet Giderleri / Net Satışlar Oranı (%)	11.7	11.9	5.8	9.8	16.6	11.3	12.1	5.9	9.9	16.7	10.7	12.0	5.8	9.8	16.7					
f)Faiz Giderleri / Net Satışlar Oranı (%)	11.0	8.7	1.6	5.8	13.7	5.8	5.2	1.1	3.5	7.9	16.4	10.3	1.5	6.0	17.1					
3-Kar ile Finansal Yüküm. Arasındaki İlişkileri Gösteren Oranlar																				
1-Faiz Ödeme (Karşılama) Oranı																				
a)Faiz ve Vergi Öncesi Kar / Faiz Giderleri Oranı (%)	128.8	226.8	108.3	138.7	413.6	166.9	289.2	120.3	172.2	511.1	92.3	228.2	103.2	129.6	419.0					
b)Net Kar ve Faiz Giderleri / Faiz Giderleri Oranı (%)	110.5	190.9	105.0	127.7	323.8	134.7	235.4	113.7	153.4	410.3	82.6	193.4	101.2	121.1	334.8					
Firma Sayısı :			3,658					3,658					3,658							

APPENDIX 9. Sector Percentiles Published By Central Bank of the Republic of Turkey

D - İMALAT SANAYİİ

STANDART ORANLAR TABLOSU

SQ, Sektör tablosundan hesaplanan oran Q, Sektördeki firmaların oranlarının aritmetik ortalaması Sektördeki firmaların %25' inin oranı Q1'e (Alt Kartil) eşit ya da küçüktür Sektördeki firmaların %50 'sinin oranı Q2'ye (Medyan) eşit ya da küçüktür Sektördeki firmaların %75' inin oranı Q3'e (Üst Kartil) eşit ya da küçüktür	2000					2001					2002				
	SQ	Q	Q1	Q2	Q3	SQ	Q	Q1	Q2	Q3	SQ	Q	Q1	Q2	Q3
A- LİKİDİTE ORANLARI															
* 1-Cari Oran (%)	127.3	139.7	100.3	121.9	177.3	121.3	148.5	100.5	125.3	197.6	125.7	153.3	101.6	128.6	203.2
* 2-Likidite (Asit Test) Oranı (%)	75.4	76.8	41.5	67.4	104.6	73.3	81.4	41.3	68.3	115.2	74.3	83.5	43.2	70.3	116.9
3-Nakit Oranı (%)	21.4	18.6	2.1	8.7	31.2	20.9	19.0	2.2	8.4	32.4	21.8	19.1	2.1	8.4	32.3
4-Stoklar / Dönen Varlıklar Oranı (%)	36.7	42.4	24.9	40.1	58.0	35.0	41.9	23.4	38.7	58.3	36.2	42.1	24.7	39.8	57.7
* 5-Stoklar / Aktif Toplamı Oranı (%)	13.6	30.2	15.4	26.8	41.6	20.8	30.2	14.5	26.0	42.4	20.4	30.0	14.5	25.8	41.1
6-Stok Bağımlılık Oranı (%)	168.1	178.3	87.4	148.2	270.5	186.1	186.0	81.6	144.7	290.7	171.8	174.9	78.2	139.1	273.9
7-Kısa Vadeli Alacaklar / Dönen Varlıklar Oranı (%)	41.3	40.3	23.6	39.2	55.7	41.6	41.1	24.3	39.8	57.5	40.5	40.9	24.2	39.6	56.7
* 8-Kısa Vadeli Alacaklar / Aktif Toplamı Oranı (%)	15.3	28.1	14.5	25.5	39.5	24.7	29.1	14.9	26.3	41.1	22.8	28.5	14.7	25.2	39.9
B- FİNANSAL YAPI ORANLARI															
1-Yabancı Kaynaklar Toplamı / Aktif Topl. Oranı (%)	38.5	63.8	46.6	65.0	81.7	68.4	64.8	44.7	64.8	84.3	64.9	61.9	41.8	61.5	81.5
* 2-Öz Kaynaklar / Aktif Toplamı Oranı (%)	22.7	39.1	21.3	36.4	54.7	31.6	40.5	21.2	38.1	58.0	35.1	42.7	23.4	41.0	60.0
3-Öz Kaynaklar / Yabancı Kaynaklar Top. Oranı (%)	59.0	81.1	27.0	54.1	120.6	46.2	88.0	26.8	56.9	138.1	54.0	98.0	30.5	64.4	150.1
* 4-Kısa Vadeli Yabancı Kaynaklar / Pasif Top. Oranı (%)	47.5	55.4	35.1	55.3	75.1	48.9	55.4	33.2	53.7	75.6	44.8	53.1	31.3	50.8	72.8
* 5-Uzun Vadeli Yabancı Kaynaklar / Pasif Top.Oranı (%)	15.4	15.0	2.4	9.2	23.2	19.5	17.4	2.4	10.2	26.2	20.1	16.4	2.8	9.3	25.0
6-Uzun Vadeli Yab. Kaynaklar / Devamlı Sermaye Oranı (%)	29.3	29.0	6.1	20.8	45.4	38.2	32.9	5.9	21.9	53.7	36.4	30.2	6.3	21.1	46.9
7-Maddi Duran Varlıklar (Net) / Öz Kaynaklar Oranı (%)	258.3	74.0	37.3	61.1	105.5	101.6	68.3	30.7	54.9	98.5	94.6	67.3	29.8	55.7	95.9
8-Maddi Duran Varlıkl.(Net) / Uzun Vad. Yab. Kaynaklar Or. (%)	624.3	498.4	114.2	230.2	1,030.3	164.6	444.2	96.2	186.5	979.9	165.3	428.9	104.0	202.7	904.7
9-Duran Varlıklar / Yabancı Kaynaklar Toplamı Oranı (%)	163.4	55.7	19.0	40.6	81.7	59.4	53.2	16.4	38.2	81.3	67.2	58.3	17.5	41.6	87.3
10-Duran Varlıklar / Öz Kaynaklar Oranı (%)	276.7	84.5	43.8	69.6	118.6	128.7	78.1	37.4	63.1	112.6	124.4	77.3	36.8	64.4	109.3
11-Duran varlıklar / Devamlı Sermaye Oranı (%)	195.7	68.2	37.8	60.0	94.1	79.6	63.5	31.5	55.3	89.7	79.1	64.0	32.2	56.4	89.8
12-Kısa Vad. Yabancı Kaynakl./ Yabancı Kaynakl. Top.Or. (%)	75.6	88.9	81.0	99.8	100.0	71.5	87.6	79.3	99.9	100.0	69.1	88.3	80.3	100.0	100.0
13-Banka Kredileri / Aktif Toplamı Oranı (%)	16.2	25.7	8.4	21.1	38.6	30.8	24.4	5.2	17.4	37.7	27.2	24.4	7.0	18.7	36.9
14-Kısa Vad. Banka Kredileri /Kısa Vad. Yabancı Kaynakl.Or. (%)	34.7	34.9	11.9	31.6	54.7	35.7	30.6	6.5	25.0	49.7	30.4	32.9	10.1	28.7	51.2
15-Banka Kredileri / Yabancı Kaynaklar Toplamı Oranı (%)	41.9	38.0	14.8	35.6	57.9	45.0	34.5	9.5	29.8	56.7	41.9	36.8	13.6	33.5	57.7
16-Dönen Varlıklar / Aktif Toplamı oranı (%)	37.1	70.0	57.7	73.6	86.2	59.3	71.0	58.3	75.5	88.0	56.4	70.0	56.4	74.0	87.6
* 17-Maddi Duran Varlıklar (Net) / Aktif Toplamı Oranı (%)	58.8	26.6	11.2	22.6	37.7	32.1	25.4	9.5	20.9	36.5	33.2	26.2	9.5	22.0	38.1

APPENDIX 10. Sector Percentiles Published By Central Bank of the Republic of Turkey

D - İMALAT SANAYİİ

STANDART ORANLAR TABLOSU

SQ, Sektör tablosundan hesaplanan oran Q, Sektördeki firmaların oranlarının aritmetik ortalaması Sektördeki firmaların %25' inin oranı Q1'e (Alt Kartil) eşit ya da küçüktür Sektördeki firmaların %50 'sinin oranı Q2'ye (Medyan) eşit ya da küçüktür Sektördeki firmaların %75' inin oranı Q3'e (Üst Kartil) eşit ya da küçüktür						2000					2001					2002				
SQ	Q	Q1	Q2	Q3		SQ	Q	Q1	Q2	Q3	SQ	Q	Q1	Q2	Q3	SQ	Q	Q1	Q2	Q3
C- DEVİR HIZLARI																				
* 1-Stok Devir Hızı (Kez)	0.0	7.2	3.3	5.7	10.3	5.3	7.1	3.1	5.4	10.0	5.3	7.1	3.2	5.5	10.1					
* 2-Alacak Devir Hızı (Kez)	5.3	7.6	4.2	6.1	10.8	5.3	7.5	4.1	5.9	10.9	5.6	7.4	4.1	6.0	10.7					
3-Çalışma Sermayesi Devir Hızı (Kez)	2.0	2.4	1.5	2.1	3.1	1.9	2.4	1.5	2.2	3.2	2.0	2.4	1.5	2.2	3.1					
4-Net Çalışma Sermayesi Devir Hızı (Kez)	9.1	10.3	3.9	6.7	16.2	11.1	9.7	3.5	6.3	15.3	9.9	8.7	3.5	6.0	13.5					
5-Maddi Duran Varlık Devir Hızı (Kez)	1.2	10.4	3.3	6.3	16.5	3.6	12.1	3.5	6.9	20.0	3.4	11.8	3.2	6.4	19.6					
6-Duran Varlık Devir Hızı (Kez)	1.2	8.8	2.9	5.6	13.8	2.8	9.9	3.0	5.9	15.8	2.6	9.6	2.8	5.6	15.2					
* 7-Öz Kaynaklar Devir Hızı (Kez)	3.2	5.7	2.4	4.0	8.3	3.7	5.8	2.3	4.0	8.6	3.2	5.1	2.2	3.6	7.5					
* 8-Aktif Devir Hızı (Kez)	0.7	1.7	1.0	1.5	2.2	1.2	1.7	1.0	1.5	2.2	1.1	1.6	1.0	1.5	2.2					
D- KARLILIK ORANLARI																				
1-Kar ile Sermaye Arasındaki İlişkileri Gösteren Oranlar																				
a)Net Kar / Öz Kaynaklar Oranı (%)	7.3	13.0	1.9	10.6	22.7	0.0	12.3	(0.8)	9.4	24.6	6.6	12.4	1.6	10.1	23.0					
* b)Vergi Öncesi Kar / Öz Kaynaklar Oranı (%)	13.2	17.9	3.1	14.3	31.1	0.0	17.5	0.1	12.8	34.0	12.4	17.0	2.5	13.6	31.0					
c)Faiz ve Vergi Öncesi Kar /Pasif T.Oranı (%)	11.5	13.4	5.4	11.3	18.8	17.6	20.8	7.2	16.5	30.5	12.5	14.9	5.5	11.8	21.3					
d)Net Kar / Aktif Toplamı Oranı (%)	1.7	3.8	0.2	2.9	7.4	0.0	2.6	(3.1)	2.3	8.1	2.3	4.2	0.1	3.0	8.5					
e)Faal.Kar / Faal. Gerçekleştirilmesinde Kul.Varlık Or.(%)	5.4	9.2	1.9	8.3	16.0	12.7	14.6	2.4	11.9	25.2	9.8	10.1	1.9	8.4	17.5					
f)Birikmeli (Kümülatif) Karlılık Oranı (%)	2.5	3.1	0.3	1.2	5.1	3.8	2.9	0.3	1.1	4.8	3.7	2.3	0.3	0.9	3.9					
2-Kar ile Satışlar Arasındaki İlişkileri Gösteren Oranlar																				
* a)Faaliyet Karı / Net Satışlar Oranı (%)	7.2	6.0	1.4	5.4	10.2	10.4	8.8	1.8	7.9	15.7	8.0	6.7	1.3	5.8	11.3					
b)Brüt Satış Karı / Net Satışlar Oranı (%)	18.6	17.7	9.4	15.9	24.7	21.0	20.5	11.0	19.4	29.6	18.7	18.3	9.5	16.7	25.5					
c)Net Kar / Net Satışlar oranı (%)	2.3	2.7	0.2	2.0	4.8	0.0	1.6	(2.5)	1.5	4.5	2.0	2.7	0.1	2.0	5.3					
d)Satılan Malın Maliyeti / Net Satışlar Oranı (%)	81.4	82.3	75.3	84.1	90.7	79.0	79.5	70.5	80.6	89.0	81.3	81.8	74.5	83.3	90.5					
e)Faaliyet Giderleri / Net Satışlar Oranı (%)	11.3	11.9	5.8	9.7	16.4	10.6	11.6	5.7	9.7	16.0	10.7	11.7	5.9	9.7	16.1					
f)Faiz Giderleri / Net Satışlar Oranı (%)	5.6	5.0	1.1	3.4	7.7	16.1	11.3	1.6	6.6	18.5	7.2	5.3	1.0	3.3	8.7					
3-Kar ile Finansal Yüküm. Arasındaki İlişkileri Gösteren Oranlar																				
1-Faiz Ödeme (Karşılama) Oranı																				
a)Faiz ve Vergi Öncesi Kar / Faiz Giderleri Oranı (%)	174.2	301.4	122.0	175.4	531.2	94.6	207.7	102.1	125.8	383.2	152.9	340.3	120.9	176.5	628.9					
b)Net Kar ve Faiz Giderleri / Faiz Giderleri Oranı (%)	140.9	243.4	114.6	155.2	419.2	84.9	181.3	100.5	118.1	319.0	128.3	276.2	114.1	158.1	494.3					
Firma Sayısı :	3,901					3,901					3,901									

APPENDIX 11. Liquidity & Solvency Ratios

Financial Items (M Şirket)	31.12.92	31.12.93	31.12.94	31.12.95	31.12.96	31.12.97	31.12.98	31.12.1999	31.12.2000	31.12.2001	31.12.2002
Current Ratio											
Arçelik	178%	182%	163%	180%	203%	266%	309%	228%	179%	230%	206%
Banvit	163%	154%	113%	165%	102%	133%	215%	214%	223%	124%	132%
Berdan Tekst	149%	100%	115%	142%	173%	169%	130%	81%	139%	84%	70%
ÇBS	126%	138%	127%	110%	109%	86%	97%	105%	111%	86%	27%
Dardanel	75%	82%	185%	114%	105%	106%	116%	177%	45%	16%	14%
Mudurnu	#DIV/0!	96%	96%	101%	130%	102%	113%	106%	43%	8%	#DIV/0!
Raks Elk	97%	123%	204%	112%	134%	148%	70%	20%	41%	16%	40%
Kerevitaş	#DIV/0!	98%	130%	137%	117%	125%	200%	136%	80%	40%	30%
Konfrut	#DIV/0!	74%	104%	97%	152%	129%	117%	102%	101%	85%	80%
Meges	#DIV/0!	#DIV/0!	166%	166%	146%	176%	335%	92%	125%	143%	79%
Gümüşsuyu	#DIV/0!	138%	122%	75%	186%	147%	116%	114%	103%	16%	#DIV/0!
Maret	325%	232%	239%	178%	186%	119%	133%	240%	245%	152%	99%
Merko	96%	90%	161%	123%	147%	124%	109%	115%	90%	62%	66%
Lüks Kadife	140%	157%	209%	204%	183%	207%	179%	166%	100%	119%	281%
Quick Ratio (Acid Test Ratio)											
Arçelik	1%	0%	0%	1%	6%	0%	0%	9%	1%	53%	23%
Banvit	12%	13%	11%	65%	13%	30%	55%	58%	78%	7%	17%
Berdan Tekst	4%	4%	2%	8%	3%	3%	1%	0%	1%	3%	1%
ÇBS	6%	9%	2%	4%	3%	2%	3%	2%	3%	0%	0%
Dardanel	1%	2%	4%	0%	0%	0%	2%	0%	0%	0%	0%
Mudurnu	#DIV/0!	3%	7%	11%	3%	3%	1%	1%	1%	1%	#DIV/0!
Raks Elk	1%	5%	3%	9%	0%	6%	7%	1%	1%	0%	0%
Kerevitaş	#DIV/0!	3%	0%	0%	2%	0%	1%	0%	0%	1%	1%
Konfrut	#DIV/0!	10%	3%	0%	0%	2%	1%	0%	0%	0%	0%
Meges	#DIV/0!	#DIV/0!	29%	82%	8%	6%	6%	3%	2%	3%	3%
Gümüşsuyu	#DIV/0!	35%	15%	0%	1%	1%	1%	1%	2%	0%	#DIV/0!
Maret	2%	1%	11%	1%	0%	1%	0%	1%	2%	0%	0%
Merko	1%	1%	4%	1%	3%	1%	1%	1%	1%	1%	2%
Lüks Kadife	3%	5%	4%	1%	31%	12%	0%	1%	0%	3%	88%
Interest Coverage											
Arçelik	-150%	-364%	60%	-33%	-160%	294%	273%	290%	417%	121%	460%
Banvit	-2752%	-56%	-193%	-1095%	79%	355%	2224%	2183%	169%	-540%	237%
Berdan Tekst	91%	96%	87%	30%	54%	142%	123%	98%	-7%	-7%	26%
ÇBS	90%	#DIV/0!	79%	#DIV/0!	68%	70%	61%	88%	86%	8%	7%
Dardanel	97%	96%	71%	49%	-25%	120%	107%	57%	-372%	-15%	12%
Mudurnu	#DIV/0!	39%	60%	-327%	#DIV/0!	469%	318%	183%	-339%	-1943%	#DIV/0!
Raks Elk	159%	74%	63%	-13%	56%	67%	75%	-68%	-28%	7%	-16%
Kerevitaş	#DIV/0!	78%	35%	26%	-29%	-44%	103%	103%	-152%	5%	4%
Konfrut	#DIV/0!	-18%	-53%	-130%	-428%	-50%	116%	100%	-87%	-886%	-61%
Meges	#DIV/0!	#DIV/0!	27%	76%	56%	206%	-8%	7%	72%	27%	62%
Gümüşsuyu	#DIV/0!	76%	86%	#DIV/0!	-514%	180%	79%	41%	31%	-41%	#DIV/0!
Maret	703%	-4896%	-49875%	-2050%	-8155%	329%	143%	160%	1001%	-30%	-36%
Merko	-8215%	-9%	-24%	-148%	-100%	148%	173%	391%	127%	-86%	-58%
Lüks Kadife	90%	65%	-115%	-38%	-437%	25955%	133%	-12%	-69%	36%	303%
Gross Product Margin											
Arçelik	176%	175%	172%	172%	167%	37%	36%	39%	34%	31%	36%
Banvit	180%	174%	178%	170%	186%	23%	41%	31%	20%	11%	19%
Berdan Tekst	172%	169%	165%	159%	161%	39%	40%	42%	13%	28%	21%
ÇBS	159%	#DIV/0!	169%	#DIV/0!	169%	169%	172%	171%	169%	27%	21%
Dardanel	168%	153%	148%	168%	184%	49%	30%	59%	-97%	-93%	22%
Mudurnu	#DIV/0!	191%	195%	187%	181%	22%	25%	26%	-27%	-132%	#DIV/0!
Raks Elk	175%	166%	158%	165%	158%	159%	40%	26%	18%	21%	26%
Kerevitaş	#DIV/0!	172%	156%	159%	167%	170%	44%	46%	28%	27%	28%
Konfrut	#DIV/0!	185%	179%	173%	174%	178%	21%	17%	4%	-15%	5%
Meges	#DIV/0!	#DIV/0!	172%	180%	154%	48%	36%	39%	40%	35%	38%
Gümüşsuyu	#DIV/0!	157%	153%	#DIV/0!	160%	30%	27%	31%	22%	44%	#DIV/0!
Maret	186%	186%	186%	183%	182%	13%	14%	18%	16%	11%	9%
Merko	186%	184%	163%	173%	174%	23%	25%	14%	14%	18%	10%
Lüks Kadife	163%	164%	155%	164%	158%	43%	42%	24%	14%	31%	34%
Operating Profit											
Arçelik	12%	11%	7%	9%	13%	14%	12%	15%	11%	3%	15%
Banvit	5%	8%	8%	19%	1%	12%	33%	24%	3%	-8%	3%
Berdan Tekst	4%	3%	10%	15%	8%	8%	5%	-1%	-23%	-56%	-24%
ÇBS	5%	#DIV/0!	6%	#DIV/0!	12%	11%	9%	4%	4%	-114%	-50%
Dardanel	1%	2%	12%	10%	10%	9%	3%	-34%	-221%	-690%	-78%
Mudurnu	#DIV/0!	2%	1%	7%	9%	9%	10%	2%	-69%	-658%	#DIV/0!
Raks Elk	5%	13%	13%	18%	17%	13%	-6%	-174%	-216%	-539%	-281%
Kerevitaş	#DIV/0!	6%	15%	12%	10%	11%	0%	0%	-70%	-150%	-74%
Konfrut	#DIV/0!	4%	11%	16%	17%	8%	2%	1%	-3%	-24%	-13%
Meges	#DIV/0!	#DIV/0!	11%	6%	10%	14%	-22%	-22%	-4%	-40%	-12%
Gümüşsuyu	#DIV/0!	6%	6%	#DIV/0!	33%	10%	-5%	-24%	-20%	-602%	#DIV/0!
Maret	5%	5%	7%	10%	8%	4%	2%	4%	4%	-2%	-5%
Merko	2%	2%	16%	14%	10%	5%	7%	5%	0%	-22%	-5%
Lüks Kadife	3%	9%	26%	15%	27%	27%	7%	-24%	-27%	-21%	16%
Working Capital/ Assets											
Arçelik	35%	35%	31%	35%	37%	46%	49%	43%	35%	45%	40%
Banvit	21%	22%	7%	27%	1%	18%	43%	38%	37%	9%	12%
Berdan Tekst	18%	0%	7%	14%	19%	18%	12%	-12%	12%	-8%	-17%
ÇBS	19%	25%	19%	6%	7%	-11%	3%	7%	8%	-132%	-222%
Dardanel	-19%	-12%	31%	8%	4%	5%	11%	34%	-84%	-299%	-312%
Mudurnu	#DIV/0!	-3%	-3%	0%	14%	1%	7%	4%	-69%	-196%	#DIV/0!
Raks Elk	-2%	12%	37%	7%	15%	21%	-15%	-33%	-22%	-78%	-20%
Kerevitaş	#DIV/0!	-2%	19%	20%	12%	17%	38%	19%	-17%	-94%	-137%
Konfrut	#DIV/0!	16%	-2%	-1%	13%	11%	6%	1%	0%	-7%	-8%
Meges	#DIV/0!	#DIV/0!	29%	32%	25%	33%	51%	22%	15%	22%	-21%
Gümüşsuyu	#DIV/0!	20%	10%	-24%	19%	17%	7%	7%	1%	-57%	#DIV/0!
Maret	20%	27%	28%	24%	22%	6%	10%	29%	27%	15%	0%
Merko	-3%	-5%	19%	8%	14%	7%	4%	6%	-5%	-28%	-21%
Lüks Kadife	25%	31%	46%	43%	34%	36%	32%	31%	0%	13%	54%
EBIT/ASSETS											
Arçelik	32%	27%	31%	26%	29%	15%	11%	14%	12%	-7%	16%
Banvit	19%	35%	30%	59%	11%	25%	57%	41%	2%	-14%	3%
Berdan Tekst	19%	16%	23%	25%	17%	-5%	-8%	-15%	-26%	-124%	-63%
ÇBS	39%	0%	10%	0%	8%	3%	4%	3%	11%	-370%	-166%
Dardanel	17%	31%	32%	17%	9%	-9%	-5%	-30%	-146%	-635%	-176%
Mudurnu	#DIV/0!	22%	9%	31%	12%	7%	8%	-1%	-87%	-103%	#DIV/0!
Raks Elk	22%	31%	37%	23%	37%	31%	-28%	-131%	-65%	-273%	-87%
Kerevitaş	#DIV/0!	31%	28%	22%	10%	9%	-13%	-10%	-53%	-179%	-100%
Konfrut	#DIV/0!	10%	24%	29%	27%	11%	-6%	-12%	-3%	-20%	-15%
Meges	#DIV/0!	#DIV/0!	41%	28%	30%	11%	-56%	-60%	-18%	-123%	-53%
Gümüşsuyu	#DIV/0!	33%	43%	9%	23%	0%	-18%	-49%	-38%	-107%	#DIV/0!
Maret	8%	10%	14%	28%	18%	7%	-3%	3%	9%	-8%	-21%
Merko	3%	4%	29%	17%	15%	-4%	-1%	2%	-1%	-28%	-6%
Lüks Kadife	34%	49%	62%	36%	45%	34%	1%	-28%	-43%	-95%	18%
Net Worth /Liabilities											
Arçelik	71%	70%	59%	74%	80%	93%	121%	101%	84%	67%	74%
Banvit	79%	75%	64%	113%	56%	51%	123%	118%	75%	22%	55%
Berdan Tekst	83%	84%	104%	124%	121%	121%	82%	46%	42%	-21%	-21%
ÇBS	33%	24%	21%	35%	23%	30%	6%	2%	-32%	-68%	-71%
Dardanel	16%	15%	108%	45%	30%	32%	35%	12%	-46%	-81%	-80%
Mudurnu	#DIV/0!	43%	40%	105%	80%	67%	70%	30%	-29%	-60%	#DIV/0!
Raks Elk	65%	86%	115%	55%	60%	51%	43%	-29%	-33%	-61%	-60%
Kerevitaş	#DIV/0!	25%	51%	53%	26%	20%	104%	59%	5%	-42%	-49%
Konfrut	#DIV/0!	58%	80%	88%	188%	77%	94%	101%	98%	51%	78%
Meges	#DIV/0!	#DIV/0!	121%	84%	73%	121%	46%	0%	5%	-18%	-1%
Gümüşsuyu	#DIV/0!	52%	43%	5%	297%	150%	80%	35%	41%	24%	#DIV/0!
Maret	703%	313%	331%	197%	238%	171%	181%	262%	268%	173%	82%
Merko	21%	35%	110%	84%	114%	97%	85%	81%	57%	19%	35%
Lüks Kadife	46%	62%	102%	102%	100%	105%	102%	42%	27%	26%	167%

APPENDIX 11. Leverage Ratios

Financial Items (M.Şirket)	31.12.92	31.12.93	31.12.94	31.12.95	31.12.96	31.12.97	31.12.98	31.12.1999	31.12.2000	31.12.2001	31.12.2002
Debt to Net Worth											
CBS	301%	420%	484%	289%	429%	329%	1595%	6156%	-314%	-147%	-140%
Dardanel	611%	688%	93%	222%	328%	315%	287%	857%	-215%	-123%	-125%
Mudurnu	#DIV/0!	234%	251%	96%	124%	150%	143%	329%	-347%	-168%	#DIV/0!
Kerevitaş	#DIV/0!	393%	196%	187%	385%	508%	96%	171%	1929%	-239%	-202%
Konfrut	#DIV/0!	180%	124%	114%	53%	130%	106%	99%	102%	198%	128%
Meges	#DIV/0!	#DIV/0!	82%	118%	134%	83%	216%	-45491%	1972%	-546%	-6885%
Berdan Teks	121%	201%	118%	96%	81%	82%	122%	217%	239%	-485%	-480%
Raks Elk	154%	116%	87%	183%	167%	196%	230%	-344%	-302%	-163%	-166%
Gümüşsuyu	#DIV/0!	192%	232%	1820%	34%	66%	126%	288%	244%	422%	#DIV/0!
Banvit	127%	133%	156%	89%	179%	195%	82%	85%	134%	447%	182%
Maret	14%	32%	30%	51%	42%	59%	55%	38%	37%	58%	122%
Merko	482%	287%	91%	119%	88%	103%	118%	123%	176%	525%	288%
Arçelik	140%	143%	170%	135%	125%	108%	83%	99%	119%	149%	135%
Lüks Kadife	220%	161%	98%	98%	100%	95%	98%	240%	370%	386%	60%
Debt to Assets											
CBS	75%	81%	83%	74%	81%	77%	94%	98%	147%	315%	348%
Dardanel	86%	87%	48%	69%	77%	76%	74%	90%	187%	526%	505%
Mudurnu	#DIV/0!	70%	72%	49%	55%	60%	59%	77%	140%	247%	#DIV/0!
Kerevitaş	#DIV/0!	80%	66%	65%	79%	84%	49%	63%	95%	172%	198%
Konfrut	#DIV/0!	64%	55%	53%	35%	57%	52%	50%	51%	66%	56%
Meges	#DIV/0!	#DIV/0!	45%	54%	57%	45%	68%	100%	95%	122%	101%
Berdan Teks	55%	67%	54%	49%	45%	45%	55%	68%	71%	126%	126%
Raks Elk	61%	54%	47%	65%	63%	66%	70%	141%	150%	258%	251%
Gümüşsuyu	#DIV/0!	66%	70%	95%	25%	40%	56%	74%	71%	81%	#DIV/0!
Banvit	56%	57%	61%	47%	64%	66%	45%	46%	57%	82%	64%
Maret	12%	24%	23%	34%	30%	37%	36%	28%	27%	37%	55%
Merko	83%	74%	48%	54%	47%	51%	54%	55%	64%	84%	74%
Arçelik	58%	59%	63%	58%	56%	52%	45%	50%	54%	60%	57%
Lüks Kadife	69%	62%	50%	50%	50%	49%	49%	71%	79%	79%	37%
LTD to Assets											
CBS	2%	15%	11%	10%	7%	2%	2%	33%	75%	108%	45%
Dardanel	8%	18%	11%	8%	4%	2%	3%	45%	35%	169%	143%
Mudurnu	#DIV/0!	0%	0%	7%	9%	9%	7%	12%	19%	34%	#DIV/0!
Kerevitaş	#DIV/0!	1%	1%	9%	13%	16%	11%	9%	14%	17%	3%
Konfrut	#DIV/0!	3%	12%	5%	10%	20%	17%	13%	11%	20%	16%
Meges	#DIV/0!	#DIV/0!	1%	6%	3%	2%	47%	21%	35%	71%	5%
Berdan Teks	18%	12%	8%	16%	19%	19%	17%	6%	39%	76%	70%
Raks Elk	11%	2%	11%	7%	18%	22%	20%	100%	113%	165%	218%
Gümüşsuyu	#DIV/0!	14%	22%	0%	4%	4%	10%	25%	18%	13%	#DIV/0!
Banvit	23%	17%	9%	5%	5%	12%	8%	12%	27%	45%	27%
Maret	4%	4%	3%	3%	4%	5%	6%	7%	9%	9%	8%
Merko	21%	24%	16%	18%	17%	19%	14%	15%	15%	11%	14%
Arçelik	13%	16%	14%	14%	20%	24%	22%	16%	10%	25%	20%
Lüks Kadife	7%	7%	7%	8%	8%	15%	9%	23%	8%	10%	8%
Total Coverage Ratio											
CBS	122%	113%	110%	95%	99%	83%	94%	70%	54%	24%	23%
Dardanel	68%	66%	142%	100%	100%	103%	111%	88%	36%	11%	10%
Mudurnu	#DIV/0!	96%	96%	86%	109%	86%	98%	89%	38%	7%	#DIV/0!
Kerevitaş	#DIV/0!	97%	127%	117%	98%	101%	154%	117%	68%	36%	29%
Konfrut	#DIV/0!	70%	82%	88%	108%	83%	78%	76%	80%	60%	57%
Meges	#DIV/0!	#DIV/0!	164%	147%	139%	168%	107%	73%	79%	60%	75%
Berdan Teks	101%	81%	97%	95%	99%	98%	90%	74%	62%	33%	31%
Raks Elk	79%	119%	156%	100%	96%	98%	50%	6%	10%	6%	5%
Gümüşsuyu	#DIV/0!	108%	83%	75%	160%	131%	95%	76%	77%	14%	#DIV/0!
Banvit	96%	109%	97%	147%	93%	109%	178%	156%	117%	56%	76%
Maret	230%	194%	209%	161%	159%	104%	111%	180%	167%	117%	85%
Merko	71%	60%	108%	82%	94%	76%	82%	83%	68%	54%	53%
Arçelik	137%	131%	126%	137%	131%	143%	161%	154%	145%	135%	136%
Lüks Kadife	126%	140%	178%	169%	152%	144%	147%	111%	89%	104%	223%
Measure of Illiquidity											
CBS	0%	0%	0%	0%	0%	31%	8%	22%	1%	1%	0%
Dardanel	0%	0%	0%	0%	0%	10%	8%	6%	13%	22%	25%
Mudurnu	#DIV/0!	1%	0%	0%	0%	42%	37%	28%	44%	79%	#DIV/0!
Kerevitaş	#DIV/0!	0%	2%	2%	1%	1%	19%	20%	28%	31%	36%
Konfrut	#DIV/0!	0%	0%	0%	0%	0%	60%	62%	59%	60%	68%
Meges	#DIV/0!	#DIV/0!	0%	0%	0%	22%	25%	26%	24%	26%	24%
Berdan Teks	5%	3%	3%	3%	2%	55%	50%	34%	40%	51%	55%
Raks Elk	0%	0%	0%	0%	0%	0%	46%	60%	55%	56%	60%
Gümüşsuyu	#DIV/0!	0%	1%	0%	0%	46%	44%	40%	44%	89%	#DIV/0!
Banvit	0%	0%	0%	1%	1%	26%	19%	27%	30%	48%	46%
Maret	0%	0%	0%	0%	0%	50%	52%	48%	53%	55%	52%
Merko	0%	0%	0%	0%	0%	48%	47%	43%	52%	50%	57%
Arçelik	0%	0%	0%	0%	0%	21%	22%	16%	14%	13%	11%
Lüks Kadife	0%	0%	0%	0%	0%	30%	27%	21%	29%	16%	16%
Gross Product Margin											
CBS	159%	#DIV/0!	169%	#DIV/0!	169%	169%	172%	171%	169%	27%	21%
Dardanel	168%	153%	148%	168%	184%	49%	30%	59%	-97%	-93%	22%
Mudurnu	#DIV/0!	191%	195%	187%	181%	22%	25%	26%	-27%	-132%	#DIV/0!
Kerevitaş	#DIV/0!	172%	156%	159%	167%	170%	44%	46%	28%	27%	28%
Konfrut	#DIV/0!	185%	179%	173%	174%	178%	21%	17%	4%	-15%	5%
Meges	#DIV/0!	#DIV/0!	172%	180%	154%	48%	36%	39%	40%	35%	38%
Berdan Teks	172%	169%	165%	159%	161%	39%	40%	42%	13%	28%	21%
Raks Elk	175%	166%	158%	165%	158%	159%	40%	26%	18%	21%	26%
Gümüşsuyu	#DIV/0!	157%	153%	#DIV/0!	160%	30%	27%	31%	22%	44%	#DIV/0!
Banvit	180%	174%	178%	170%	186%	23%	41%	31%	20%	11%	19%
Maret	186%	186%	186%	183%	182%	13%	14%	18%	16%	11%	9%
Merko	186%	184%	163%	173%	174%	23%	25%	14%	14%	18%	10%
Arçelik	176%	175%	172%	172%	167%	37%	36%	39%	34%	31%	36%
Lüks Kadife	163%	164%	155%	164%	158%	43%	42%	24%	14%	31%	34%
Operating Profit											
CBS	5%	#DIV/0!	6%	#DIV/0!	12%	11%	9%	4%	4%	-114%	-50%
Dardanel	1%	2%	12%	10%	10%	9%	3%	-34%	-221%	-690%	-78%
Mudurnu	#DIV/0!	2%	1%	7%	9%	9%	10%	2%	-69%	-658%	#DIV/0!
Kerevitaş	#DIV/0!	6%	15%	12%	10%	11%	0%	0%	-70%	-150%	-74%
Konfrut	#DIV/0!	4%	11%	16%	17%	8%	2%	1%	-3%	-24%	-13%
Meges	#DIV/0!	#DIV/0!	11%	6%	10%	14%	-22%	-22%	-4%	-40%	-12%
Berdan Teks	4%	3%	10%	15%	8%	8%	5%	-1%	-23%	-56%	-24%
Raks Elk	5%	13%	13%	18%	17%	13%	-6%	-174%	-216%	-539%	-281%
Gümüşsuyu	#DIV/0!	6%	6%	#DIV/0!	33%	10%	-5%	-24%	-20%	-602%	#DIV/0!
Banvit	5%	8%	8%	19%	1%	12%	33%	24%	3%	-8%	3%
Maret	5%	5%	7%	10%	8%	4%	2%	4%	4%	-2%	-5%
Merko	2%	2%	16%	14%	10%	5%	7%	5%	0%	-22%	-5%
Arçelik	12%	11%	7%	9%	13%	14%	12%	15%	11%	3%	15%
Lüks Kadife	3%	9%	26%	15%	27%	27%	7%	-24%	-27%	-21%	16%

APPENDIX 12. Profitability Ratios

Financial Şirket	31.12.92	31.12.93	31.12.94	31.12.95	31.12.96	31.12.97	31.12.98	31.12.1999	31.12.2000	31.12.2001	31.12.2002
Return On Equity											
CBS	13%	0%	9%	0%	8%	3%	14%	18%	-3%	82%	32%
Dardanel	3%	10%	12%	16%	17%	11%	2%	-87%	138%	77%	21%
Mudurnu	#DIV/0!	22%	10%	36%	22%	22%	33%	10%	170%	67%	#DIV/0!
Kerevitaş	#DIV/0!	26%	26%	25%	25%	23%	1%	1%	-767%	121%	51%
Konfrut	#DIV/0!	14%	26%	37%	35%	14%	2%	0%	-6%	-56%	-24%
Meges	#DIV/0!	#DIV/0!	23%	10%	15%	19%	-94%	13108%	-74%	229%	978%
Berdan Tekst	3%	2%	4%	18%	9%	8%	6%	-1%	-42%	277%	102%
Gümüşsuyu	#DIV/0!	18%	17%	100%	12%	10%	-7%	-70%	-52%	-352%	#DIV/0!
Raks Elk	11%	29%	17%	34%	26%	20%	-19%	230%	86%	91%	34%
Banvit	40%	27%	35%	64%	3%	43%	74%	47%	4%	-71%	9%
Maret	-2%	7%	10%	18%	15%	9%	6%	6%	8%	-7%	-27%
Arçelik	41%	43%	21%	28%	39%	39%	30%	30%	22%	6%	30%
Merko	18%	8%	26%	26%	22%	7%	10%	8%	1%	-120%	-15%
Lüks Kadife	10%	26%	57%	30%	49%	50%	4%	-51%	-131%	-180%	46%
Return On Assets											
CBS	3%	0%	2%	0%	1%	1%	1%	0%	1%	-177%	-80%
Dardanel	0%	1%	6%	5%	4%	3%	0%	-9%	-120%	-327%	-83%
Mudurnu	#DIV/0!	7%	3%	18%	10%	9%	14%	2%	-69%	-99%	#DIV/0!
Kerevitaş	#DIV/0!	5%	9%	9%	5%	4%	0%	0%	-38%	-87%	-50%
Konfrut	#DIV/0!	5%	12%	18%	23%	6%	1%	0%	-3%	-19%	-11%
Meges	#DIV/0!	#DIV/0!	13%	4%	6%	10%	-30%	-29%	-4%	-51%	-14%
Berdan Tekst	1%	1%	2%	9%	5%	5%	3%	0%	-12%	-72%	-27%
Gümüşsuyu	#DIV/0!	6%	5%	5%	9%	6%	-3%	-18%	-15%	-68%	#DIV/0!
Raks Elk	4%	13%	9%	12%	10%	7%	-6%	-94%	-42%	-143%	-52%
Banvit	18%	12%	14%	34%	1%	15%	41%	26%	2%	-13%	3%
Maret	-1%	5%	8%	12%	11%	6%	4%	4%	6%	-5%	-12%
Arçelik	17%	18%	8%	12%	18%	19%	16%	15%	10%	2%	13%
Merko	3%	2%	14%	12%	12%	3%	5%	4%	0%	-19%	-4%
Lüks Kadife	3%	10%	29%	15%	25%	26%	2%	-15%	-28%	-37%	29%
Net Profit Margin											
CBS	3%	#DIV/0!	3%	#DIV/0!	5%	4%	4%	2%	2%	-114%	-50%
Dardanel	1%	1%	8%	7%	6%	6%	1%	-33%	-221%	-644%	-79%
Mudurnu	#DIV/0!	1%	1%	5%	7%	8%	9%	3%	-66%	-655%	#DIV/0!
Kerevitaş	#DIV/0!	5%	9%	11%	8%	7%	1%	1%	-70%	-150%	-76%
Konfrut	#DIV/0!	3%	8%	13%	17%	7%	2%	0%	-5%	-24%	-15%
Meges	#DIV/0!	#DIV/0!	6%	3%	4%	7%	-23%	-22%	-3%	-39%	-11%
Berdan Tekst	2%	1%	2%	11%	7%	6%	4%	-1%	-20%	-71%	-24%
Gümüşsuyu	#DIV/0!	6%	5%	#DIV/0!	14%	8%	-4%	-24%	-19%	-682%	#DIV/0!
Raks Elk	4%	13%	9%	17%	11%	8%	-8%	-220%	-290%	-570%	-342%
Banvit	5%	3%	5%	11%	0%	6%	23%	15%	1%	-8%	2%
Maret	-1%	3%	4%	6%	5%	2%	1%	2%	2%	-2%	-5%
Arçelik	8%	8%	4%	6%	10%	11%	9%	11%	7%	2%	10%
Merko	2%	2%	12%	14%	13%	4%	7%	5%	1%	-23%	-5%
Lüks Kadife	2%	5%	16%	9%	16%	20%	2%	-25%	-27%	-22%	15%
Gross Product Margin											
CBS	159%	#DIV/0!	169%	#DIV/0!	169%	169%	172%	171%	169%	27%	21%
Dardanel	168%	153%	148%	168%	184%	49%	30%	59%	-97%	-93%	22%
Mudurnu	#DIV/0!	191%	195%	187%	181%	22%	25%	26%	-27%	-132%	#DIV/0!
Kerevitaş	#DIV/0!	172%	156%	159%	167%	170%	44%	46%	28%	27%	28%
Konfrut	#DIV/0!	185%	179%	173%	174%	178%	21%	17%	4%	-15%	5%
Meges	#DIV/0!	#DIV/0!	172%	180%	154%	48%	36%	39%	40%	35%	38%
Berdan Tekst	172%	169%	165%	159%	161%	39%	40%	42%	13%	28%	21%
Gümüşsuyu	#DIV/0!	157%	153%	#DIV/0!	160%	30%	27%	31%	22%	44%	#DIV/0!
Raks Elk	175%	166%	158%	165%	158%	159%	40%	26%	18%	21%	26%
Banvit	180%	174%	178%	170%	186%	23%	41%	31%	20%	11%	19%
Maret	186%	186%	186%	183%	182%	13%	14%	18%	16%	11%	9%
Arçelik	176%	175%	172%	172%	167%	37%	36%	39%	34%	31%	36%
Merko	186%	184%	163%	173%	174%	23%	25%	14%	14%	18%	10%
Lüks Kadife	163%	164%	155%	164%	158%	43%	42%	24%	14%	31%	34%
Operating Profit											
CBS	5%	#DIV/0!	6%	#DIV/0!	12%	11%	9%	4%	4%	-114%	-50%
Dardanel	1%	2%	12%	10%	10%	9%	3%	-34%	-221%	-690%	-78%
Mudurnu	#DIV/0!	2%	1%	7%	9%	9%	10%	2%	-69%	-658%	#DIV/0!
Kerevitaş	#DIV/0!	6%	15%	12%	10%	11%	0%	0%	-70%	-150%	-74%
Konfrut	#DIV/0!	4%	11%	16%	17%	8%	2%	1%	-3%	-24%	-13%
Meges	#DIV/0!	#DIV/0!	11%	6%	10%	14%	-22%	-22%	-4%	-40%	-12%
Berdan Tekst	4%	3%	10%	15%	8%	8%	5%	-1%	-23%	-56%	-24%
Gümüşsuyu	#DIV/0!	6%	6%	#DIV/0!	33%	10%	-5%	-24%	-20%	-602%	#DIV/0!
Raks Elk	5%	13%	13%	18%	17%	13%	-6%	-174%	-216%	-539%	-281%
Banvit	5%	8%	8%	19%	1%	12%	33%	24%	3%	-8%	3%
Maret	5%	5%	7%	10%	8%	4%	2%	4%	4%	-2%	-5%
Arçelik	12%	11%	7%	9%	13%	14%	12%	15%	11%	3%	15%
Merko	2%	2%	16%	14%	10%	5%	7%	5%	0%	-22%	-5%
Lüks Kadife	3%	9%	26%	15%	27%	27%	7%	-24%	-27%	-21%	16%
Sales/assets											
CBS	117%	0%	48%	0%	29%	14%	18%	12%	53%	155%	158%
Dardanel	85%	100%	83%	73%	61%	48%	34%	27%	54%	51%	105%
Mudurnu	#DIV/0!	488%	411%	383%	135%	112%	152%	87%	104%	15%	#DIV/0!
Kerevitaş	#DIV/0!	114%	97%	81%	63%	58%	57%	44%	54%	58%	66%
Konfrut	#DIV/0!	151%	151%	136%	136%	84%	70%	100%	60%	78%	69%
Meges	#DIV/0!	#DIV/0!	220%	157%	159%	145%	130%	131%	130%	131%	130%
Berdan Tekst	93%	73%	84%	83%	75%	75%	66%	48%	61%	101%	113%
Gümüşsuyu	#DIV/0!	109%	110%	0%	65%	73%	76%	75%	78%	10%	#DIV/0!
Raks Elk	106%	101%	98%	73%	92%	80%	77%	43%	15%	25%	15%
Banvit	333%	346%	295%	303%	338%	244%	179%	174%	159%	159%	169%
Maret	143%	211%	203%	205%	212%	266%	284%	255%	244%	229%	218%
Arçelik	213%	210%	174%	195%	176%	168%	174%	140%	136%	138%	132%
Merko	139%	131%	112%	87%	94%	72%	69%	74%	68%	84%	73%
Lüks Kadife	169%	214%	184%	167%	150%	129%	88%	61%	103%	169%	196%

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