



ICAP S.A.

CREDIT RATINGS ASSIGNMENT METHODOLOGY

SEPTEMBER 2019

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INTRODUCTION

This document outlines the methodology developed and applied by ICAP for assigning credit ratings to Greek companies according to the provisions of the amended Regulation 1060/2009 of the European Parliament and of the Council of 16 September 2009.

This methodology does not cover the assignment of Credit Ratings to Companies operating in Special Activities, to Holding Companies and Real Estate Investment Companies (REICs) for which specialised methodologies have been developed, the documents of which are uploaded in ICAP's website.

Prior to the description of the applied methodology, the data sources that ICAP utilises for the credit ratings assignment are mentioned as well as the necessary definitions for the development of the methodology.

The methodology applied consists of two parts. The first part relates to an initial rating of companies via statistical models developed in-house, whereas the second part relates to the assessment of company's qualitative characteristics by an Analyst.

FIRST PART

ICAP has developed different credit risk statistical models, based on the segmentation of companies according to the availability of financial data, legal status, size and activity sector, that evaluate financial and commercial data as well as derogatory information of private companies.

SECOND PART

The following step is the qualitative assessment of the Analyst in order to assign a credit rating to the company. The Analyst makes use of the data and the result of the statistical algorithm and enhances them with the assessment of qualitative characteristics. Based on the combination of the above information, the Analyst assigns a credit rating to the company.

1. DATA SOURCES

For the assessment of the companies' creditworthiness, ICAP uses the data sources mentioned below for the obtainment of the necessary information:

- The assessed companies (interview / questionnaire)
- The General Commercial Registry (Γ.Ε.ΜΗ.)
- The Government Gazettes
- The Stock Exchange
- First Instance Courts
- Chambers
- Publications on financial press
- Associated companies
- ICAP's sectorial studies
- Various publicly available sources

The obtained information are then stored in ICAP Databank for further processing and for the assignment of credit ratings.

2. CREDIT RATINGS ASSIGNMENT PROCESS

This section describes the process that ICAP developed for the assignment of credit ratings to companies according to the requirements of Regulation 1060/2009 of the European Parliament and of the Council of 16 September 2009.

The assignment of a credit rating to a company is related with the estimation of the company's probability of default, according to ICAP's definition of default, for the following 12 months (time horizon of estimation). More information on the definition of default and the time horizon of the estimation can be found on paragraph 2.1.

The credit rating assignment process is activated after the completion of the quality control of the information collected during the update process and is consisted of the following steps:

- Execution of the statistical algorithm that assesses the financial accounts, the derogatory data and the commercial characteristics of the company (see paragraph 2.3).
- Qualitative assessment of the economic unit from the Analyst. The answer selected by the Analyst corresponds to a scoring system, resulting in a final result. Each result corresponds to a proposal to adapt the evaluation of the statistical algorithm, as has been obtained from the previous step (see paragraph 2.4).
- Evaluation by the Analyst of specified criteria for the entity under consideration, where applicable, which may lead to a final configuration of the proposed rating score, resulting from the two preceding stages (see paragraph 2.5).
- Sensitivity Analysis. The variables involved in the formulation of the final proposed credit rating in the previous stages of the analysis are examined and recalculated, based on specific stress scenarios, resulting to the identification of those factors and benchmarks that may, and under certain conditions, lead to a differentiation of the credit rating during a future reassessment of the rated entity (see paragraph 2.6).
- Final credit rating. The assessment of the firm in question as analyzed by the Analyst during the previous three stages is considered by the Lead Analyst and in specific cases / conditions by the Rating Committee giving the final approval (see paragraph 2.7).

2.1 Basic Definitions

2.1.1 Time Horizon

Time horizon refers to the period over which the default probability is estimated. Depending on the objective of the methodology (estimating the short-term or medium-long-term default probability), time horizon varies. In literature and international best practices there are models designed to predict default for one to five years. ICAP methodology is developed to estimate the probability of default of private companies, i.e. 12 months after the date they were rated.

2.1.2 Definition of Default

The default definition is important for the development of the methodology, as it classifies companies as 'defaulted' and 'non-defaulted'. According to the requirements of the regulatory framework, a company is characterized as 'defaulted' when either or both of the two following events have taken place:

- The obligor is not able to pay its credit obligations,
- The obligor is past due more than 90 days on any material credit obligation.

According to the new regulatory framework, the elements that indicate the inability of the obligor to fulfil its obligations include bankruptcy as well as any other event that could cause problems in the company's viability and consistency in fulfilling its obligations.

ICAP's database includes data of derogatory information derived from ICAP's primary research from first instance courts and government gazettes. This information includes:

- Bankruptcy
- Bankruptcy petition
- Payment order
- Seizure
- Movable Property Auction
- Real Estate Auction
- Other Pre-Bankruptcy events.

The aforementioned derogatory information shapes the definition of default. A company is characterized as 'defaulted' for a one-year time horizon if specific conditions are met according to the available derogatory information.

A company is characterized as 'non-defaulted' if there is:

- no event of bankruptcy
- no event of bankruptcy petition and
- no delay of payments.

2.2 Companies Exceptions

ICAP does not assign credit ratings to private companies in the following cases:

2.2.1 Inactive Companies

A company is defined as 'Inactive' if it presents a terminal business failure event before the assessment date. Tables 2.1 and 2.2 below summarize the terminal business failure events.

Table 2.1: Terminal business Failure Events (Instance Courts and Government gazettes)

Description of Terminal Business Failure Events
Merger
Dissolution
Liquidation
Revocation of Co's Formation or Conversion License
Bankruptcy
Liquidation Balance Sheet
Work Suspension
Division
Merger by Absorption

Table 2.2: Special Events

Description of Special Events
The Company is under a special type of Liquidation
The Company has been Merged
The Company has been Dissolved
The company has been divided
The Company has been Absorbed
The Company is Inactive
The company operates at a limited scale
Bankruptcy Revocation
The negotiations of Company's Shares at the Athens Stock Exchange has been Suspended
The Company is set Under Liquidation
The Company has published a Liquidation Balance Sheet

2.2.2 Exceptions of Activity Sector

ICAP does not assign ratings to companies belonging to the activity sectors described in the following tables.

Table 2.3: Excluded Activity Sectors - based on NACE Rev.2

NACE Rev.2 Codes	Description of Activity Sectors Excluded
64xx	Financial service activities, except insurance and pension funding
65xx	Insurance, reinsurance and pension funding, except compulsory social security
66xx	Activities auxiliary to financial services and insurance activities
84xx	Public administration and defence; compulsory social security

Table 2.4: Excluded Activity Sectors - based on ICAP's segmentation

Description of Activity Sectors Excluded
Banks
Factoring
Currency Exchange Agencies
Stock Exchange
Stock Brokerage Firms
Investment Services
Investing Brokers
Leasing
Mutual Funds
Portfolio & Investment Companies
Venture Capital Companies
Financial Services
Insurance
Insurance Brokers - Agents

These sectors are excluded due to the significant differentiation of their activities as well as to the reporting ways of their financial statements.

2.3 Statistical Algorithm Assessment

The assessment of the companies via the algorithmic procedure relates to the development of statistical models that detect which information should be assessed with the aim of estimating accurately the probability of default and supporting the assessment and the final decision of the Analyst.

For the most recent revision of the credit rating models a statistical sample of 495,303 companies was collected for the period 2003 – 2011. The examination of numerous years of default allows the collection of sufficient samples of companies (defaulters – non defaulters) for studying the financial statements per activity sector (Industry – Trade – Services), as well as the exploration of a relatively long performance period which could include recession or growth periods of the Greek economy.

Additionally, it was decided to develop different credit models by the segmentation of companies according to common features so as to detect those characteristics that will estimate more accurately the probability of default.

It should be noted that the companies which are not assessed according to the procedure provisioned by the Regulation 1060/2009 of the European Parliament and of the Council are assigned the rating that the statistical algorithm produced.

In order to clearly distinguish these ratings from the ones which are assessed according to the Regulation 1060/2009, these are indicated as Scores.

The sections below outline the classification rules of the sample and the process followed for the development of the credit rating models with a separate reference for other activities companies.

2.3.1 Classification of Companies

The classification of companies in groups with common characteristics aims to detect and score their particular characteristics, in order to make more accurate estimations of their default probabilities.

The initial categorization is performed according to the availability of financial information. Companies are categorized to the following groups (a) Societe Anonymes (SA), Limited Liability Companies (LLC), Sole Shareholder Limited Liability Companies (SLLC) with published Balance Sheet (b) SA, LLC, SLLC without published Balance Sheet, (c) General Partnerships (GP), Limited Partnerships (LP), Sole Proprietorships (SP) and (d) other activities.

'SA, LLC, SLLC with published Balance Sheet' are companies with at least one published balance sheet during the last three-year period prior to assessment date. 'SA, LLC, SLLC without published Balance Sheet' are companies which have not published any balance sheet since their establishment or they have published a balance sheet prior to the three-year period before the assessment date. The aforementioned classification is performed in order to use in each company's assessment the most recent available information for their financial status, if available. GP, LP, SP do not publish financial data, however declared annual sales and/or commissions are available from ICAP's research. The above categorization is essential as the available data for assessment differ significantly among those types of companies.

For companies with published balance sheets, additional classifications are performed:

Firstly, companies are divided according to the level of certain accounts in order to achieve a greater homogeneity of the samples for: (a) avoiding a biased assessment of the small-sized

companies, and (b) facilitating the detection of those characteristics that estimate best the default probability.

For companies which do not fulfil the minimum level of accounts restriction, empirical rules are applied for the assessment of their financial information given that many accounts of their balance sheets are missing (they consist the 4.02% of the total population of companies with reported balance sheet). All other companies are classified in two groups as follows:

(a) Companies with two successive reported balance sheets in the last three years and which fulfil the minimum level of accounts restriction (88.29% of the companies with published Balance Sheet), and

(b) Companies with one reported balance sheet in the last three years and which fulfil the minimum level of accounts restriction (15.76% of the companies with published Balance Sheet).

Companies with two successive financial statements are classified in a separate group so as to use in the statistical analysis dynamic indices, which demonstrate the trend of certain financial figures (e.g. % change in the fixed assets). For both groups an additional classification is performed according to the activity sector.

Companies are classified in three main sectors (Industry, Trade, Services) according to the NACE Code rev.2 System (based on the European classification), together with the Greek Office of National Code System. According to the first two-digit NACE codes:

- Industry includes all companies with NACE rev.2 codes less than or equal to 43. The following table summarizes the activity sectors of Industry.

Table 2.5: Industry Sector based on NACE rev.2 Codes

Description of Activity Sectors - Industry	NACE CODE
AGRICULTURE, FORESTRY AND FISHING	01xx, 02xx, 03xx
MINING AND QUARRYING	05xx, 06xx, 07xx, 08xx, 09xx
MANUFACTURING	10xx, 11xx, 12xx, 13xx, 14xx, 15xx, 16xx, 17xx, 18xx, 19xx, 20xx, 21xx, 22xx, 23xx, 24xx, 25xx, 26xx, 27xx, 28xx, 29xx, 30xx, 31xx, 32xx, 33xx
ELECTRICITY, GAS, STEAM AND AIR CONDITIONING SUPPLY	35xx
WATER SUPPLY; SEWERAGE, WASTE MANAGEMENT AND REMEDIATION ACTIVITIES	36xx, 37xx, 38xx, 39xx
CONSTRUCTION	41xx, 42xx, 43xx

- Trade includes all companies with Nace rev.2 codes 45, 46 and 47. The following table summarizes the activity sectors of Trade.

Table 2.6: Trade Sector based on NACE rev.2 Codes

Description of Activity Sectors – Trade	NACE CODES
WHOLESALE AND RETAIL TRADE; REPAIR OF MOTOR VEHICLES AND MOTORCYCLES	45xx, 46xx, 47xx

- Services include all companies with NACE rev.2 codes greater than or equal to 49. The following table summarizes the activity sectors of Services.

Table 2.7: Services Sector based on NACE rev.2 Codes

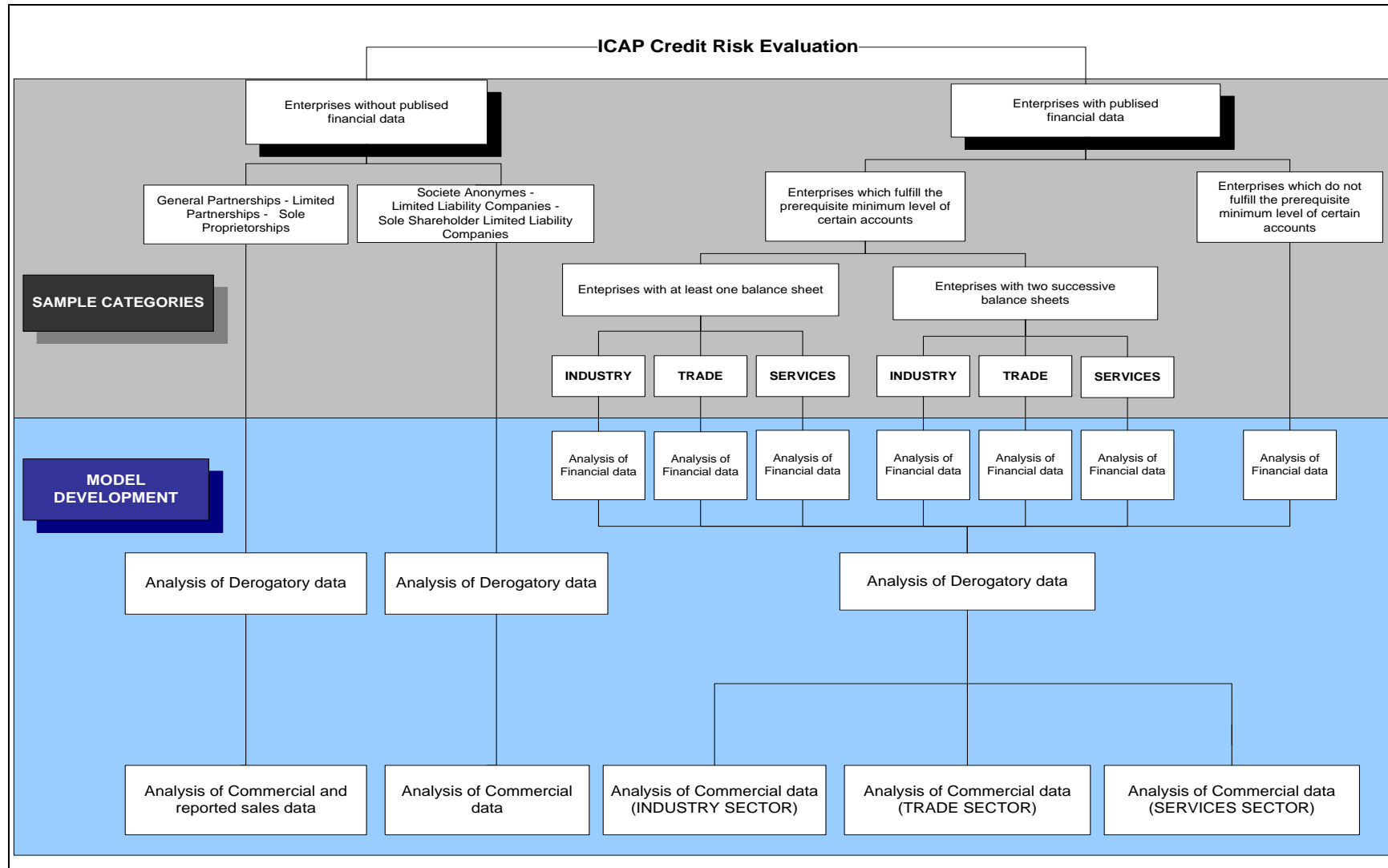
Description of Activity Sectors - Services	NACE CODES
TRANSPORTATION AND STORAGE	49xx, 50xx, 51xx, 52xx, 53xx
ACCOMMODATION AND FOOD SERVICE ACTIVITIES	55xx, 56xx
INFORMATION AND COMMUNICATION	58xx, 59xx, 60xx, 61xx, 62xx, 63xx
HOLDINGS	64xx
REAL ESTATE ACTIVITIES	68xx
PROFESSIONAL, SCIENTIFIC AND TECHNICAL ACTIVITIES	69xx, 70xx, 71xx, 72xx, 73xx, 74xx, 75xx
ADMINISTRATIVE AND SUPPORT SERVICE ACTIVITIES	77xx, 78xx, 79xx, 80xx, 81xx, 82xx
EDUCATION	85xx
HUMAN HEALTH AND SOCIAL WORK ACTIVITIES	86xx, 87xx, 88xx,
ARTS, ENTERTAINMENT AND RECREATION	90xx, 91xx, 92xx, 93xx,
OTHER SERVICE ACTIVITIES	94xx, 95xx, 96xx,
ACTIVITIES OF HOUSEHOLDS AS EMPLOYERS; UNDIFFERENTIATED GOODS- AND SERVICES-PRODUCING ACTIVITIES OF HOUSEHOLDS FOR OWN USE	97xx, 98xx
ACTIVITIES OF EXTRA TERRITORIAL ORGANIZATIONS AND BODIES	99xx

2.3.2 Flowchart

Based on the aforementioned classification process, homogeneous samples are created (according to accounts level restrictions, existence of two successive reported balance sheets and activity sector) in order to achieve an objective and focused assessment of the companies' data. The following flowchart describes this categorization of the companies into homogeneous classes used for the development of the statistical algorithms.

According to the group that each company belongs to, one of the nine combinations of the credit models is selected for assessing the characteristics of the company.

Graph 2.1: Flowchart



2.3.3 Models Development

The statistical method used for the development of the credit rating models is the logistic regression¹. The logistic regression is adopted due to the following reasons:

- It is considered as the technique with the highest predictive power among the established techniques for predicting the default probability and is acknowledged in the literature as the most popular econometric technique².
- The performance and the suitability have made logistic regression as one of the favourite among the well-known organizations³.
- It is reported as a widely used technique under the regulatory framework⁴.

The variables that demonstrate high statistical significance in predicting the default probability of companies are examined in two stages. The first stage involves the univariate analysis (initial selection of variables) and the second the multivariate analysis (final selection of variables).

The univariate analysis is applied to the total number of companies that fall to the segmentations described earlier. These samples are denominated as the 'Population Samples'.

At the stage of the multivariate analysis, and in order to have the optimal selection of variables for estimating the default probability for all models, 1:1 samples of 'non-defaulted' and 'defaulted' companies, named 'Development Samples', are created. More specifically, for the 'Development Samples' are selected from the 'Population Samples':

- all 'defaulted' companies,
- a number of 'non-defaulted' companies, selected using random sampling, equal to the number of 'defaulted' companies.

From the 'Development Sample' a percentage of 75% is selected using random sampling to form the 'Training Sample' which will be used for creating the model. The remaining 25%, the 'Validation Sample', is used for the verification of each model. In both samples, the 1:1 ratio of 'defaulted' and 'non-defaulted' companies is preserved.

The above procedure is repeated for a large number of random samplings with replacement and for different groups of "prospective" explanatory variables which are used as an input in logistic regression.

¹ In the Logistic Regression model the Probability of Default (PD) is determined through the following mathematical

$$\text{notation of the Logit function: } P(Y_j=1) = \frac{e^{\sum_i X_{ij}\beta_i}}{1 + e^{\sum_i X_{ij}\beta_i}} \text{ where } Y_j=1 \text{ is the indication of default for company } j \text{ and } \beta_i$$

are the weights for the independent variables x_i .

² - Henley, 1994, Statistical Aspects of Credit Scoring. PhD Thesis, The Open University

- Wiginton, 1980, A note on the comparison of logit and discriminant models of consumer credit behaviour, J. Finance and Quant. Analysis, 15, 757-768

- P. Joos, K. Vanhoof, H. Oogne, N. Sierens, 1998, Credit classification: a comparison of logit models and decision trees. Faculteit Economie en Bedrijfskunde, Technical Report

- Karel Komorád, 2002, Master's Thesis on Credit Scoring Estimation, Institute for Statistics and Econometrics, Humboldt University, Berlin

³ - A Fair Isaac White Paper, 2003, A Discussion of Data Analysis, Prediction and Decision Techniques

- P. Escott, F. Glormann, A. E. Kocagil, 2001, Moody's RiskCalcTM for Private Companies: The German Model. Rating Methodology

⁴ Basel Committee on Banking Supervision, Working Paper No.3, 2000, Credit Ratings and Complementary Sources of Credit Quality Information

The selection of the optimal model is realized by comparing the resulted models from all groups of variables which are used as an input in logistic regression and by evaluating their results, concerning their discriminatory power, their estimation of default probability and the business meaning of the variables used.

2.3.3.1 Input Variables

Financial Information

The assessment of financial variables for SA, LLC, SLLC with published balance sheet has been performed separately as the objective is to test their ability to predict default and to detect the variables with the highest predictive power. For the appropriate assessment of this type of data, financial ratios, account figures and variables transformations are taken into account since they offer an objective and homeomorphous way of comparing the financial status of the companies.

Financial ratios are classified into the following groups:

- Liquidity Ratios
- Activity Ratios
- Profitability Ratios
- Viability and Capital Structure Ratios

The above static ratios as well as logarithmic transformations of both ratios and account figures have been used for companies with only one reported balance sheet reported during the last 3 years before the assessment date. For companies with two successive balance sheets reported during the same period as mentioned before, apart from the above variables, the percentage difference of ratios as well as the percentage difference of account figures have been used (dynamic ratios).

Table 2.8: Financial Information Variables

1. Liquidity Ratios	
1	Current Ratio
2	Quick Ratio (ACID Test)
3	Cash Ratio
4	Working Capital
5	Short Term Liabilities to working capital
6	LOG (Working Capital)
2. Activity Ratios	
1	Collection Period
2	Payable Period
3	Inventory Turnover
4	Operating Cycle
5	Fixed Assets Turnover
6	Turnover of Capital Employed
3. Profitability Ratios	
1	Return on Equity(1) (ROE 1) (Before Income Tax)
2	Return on Capital Employed (1) (Before Income Tax) (ROCE 1)
3	Return on Capital Employed (2) (Before Interest & Income Tax) (ROCE 2)
4	Gross Profit Margin
5	Net Profit Margin (Before Income Tax)
4. Viability and Capital Structure Ratios	
1	Financial Leverage
2	Total Debt Equity Ratio
3	Equity to Fixed Assets
5. Account Figures	
1	%Change of the above Ratios
2	%Change (Current Assets/Net Sales)
3	% Change(Fixed Assets)
4	%Change (Net Income before Tax)
5	%Change (Receivables from Customers / Bills and Cheques)
6	%Change (Net Sales + Commissions and Other Operating Income)
7	%Change (Working Capital/ Net Sales)
8	LOG (Total Net Sales)
9	LOG (EBITDA)
10	LOG (Net Income before Tax)
11	LOG (Shareholders Equity)
12	Current Assets
13	Interest Coverage(Net Sales)
14	Turnover
15	Shareholders Equity/Share Capital

For the for SA, LLC, SLLC with published balance sheet which do not meet the minimum restrictions on certain accounts, the assessment is based on financial information such as Net Income before Tax, Shareholders Equity, Financial leverage and Shareholders Equity/ Share Capital.

Finally, for the GP, LP, SP only the declared Sales and Commissions are assessed (together with their commercial data), whereas for the SA, LLC and SLLC without published balance sheet only their Share Capital is assessed.

Derogatory Information

For the evaluation of the derogatory data, the information collected either from the First Instance Courts or from the General Commercial Registry (Γ.Ε.ΜΗ.), is assessed. This information includes (a) type of delinquency, (b) total value of delinquencies divided by Net Sales, (c) the number of delinquencies according to the type of data, (d) the year when delinquency occurred and (e) the percentage of settled delinquencies.

The derogatory information is evaluated by a separate model. In particular, for the evaluation of the derogatory data, companies are grouped in the following three categories: (a) the SA, LLC, SLLC with published balance sheet (b) the SA, LLC, SLLC without published balance sheet, and (c) the GP, LP, SP companies.

Commercial Information

ICAP rating model combines the commercial information with the results of the financial and derogatory data assessment. Separate models are developed for SA, LLC, SLLC with published Balance Sheets for Industry, Trade and Services, SA, LLC, SLLC without Balance Sheets and GP, LP, SP. These models classify the companies in the 10 credit rating classes developed by ICAP.

The commercial variables examined are the following: 1) Imports, 2) Exports, 3) Representations, 4) Staff, 5) Number of collaborated banks, 6) Activity Sector, 7) Legal Status, 8) Years of Operation, etc.

For the above variables are defined either value intervals or discrete categories (levels). In addition, we have explored combinations of variables such as Imports / Exports / Representations.

2.3.3.2 Initial Selection of Variables

The aim of the initial selection of variables is to detect the variables that individually have significant predictive power for estimating the probability of default.

For this purpose, the distribution of values of variables is examined and transformations are performed in order to: (a) deal with financial ratios singularities, (b) limit extreme values (outliers), (c) impose the expected monotonicity of their values with respect to default rate or formulate categorical variables (by indicating groups of values). Specifically:

(a) Financial Ratios Singularities are detected in cases where:

- Data are inadequate for calculating financial ratios and as a result missing values are generated. For example, some financial ratios could possibly take zero values in the denominator for a considerable percentage of the total number of companies. Financial ratios with % of missing values higher than a predetermined level are excluded from the analysis.
- Difficulties in the business interpretation are generated for a range of their values. These cases are specially handled.

(b) Outlier Analysis

Outlier analysis is a process that consists in limiting variables' extreme values in order to avoid bias and to approximate a normal distribution of their values. The process applied is to limit values that exceed the uppermost 97.5th percentile or fall short from the value based on the lower 2.5th percentile.

For each variable its value distribution table is created. As an example the distribution table of the ratio 'Collection Period' before and after the outlier analysis is illustrated.

Table 2.9: Outlier Analysis Example

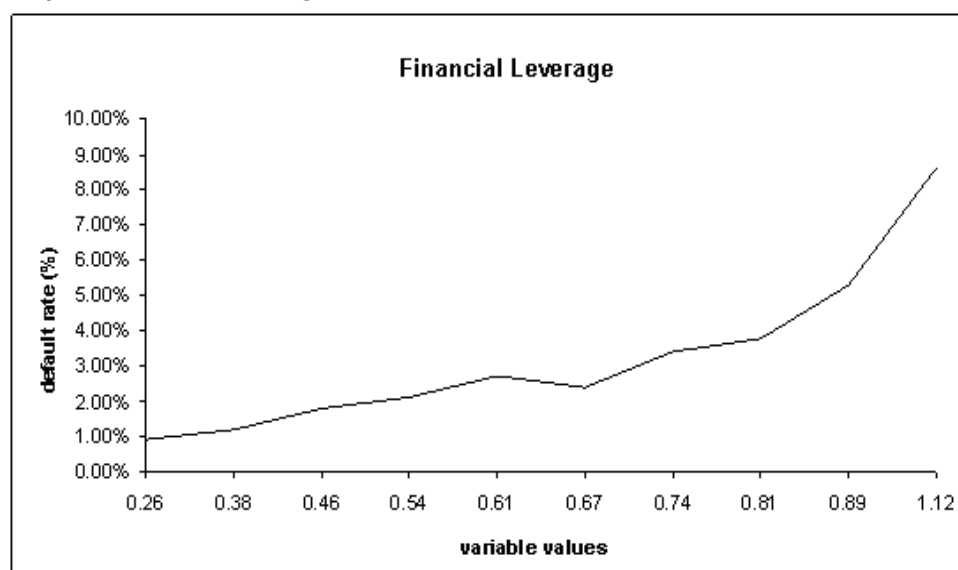
Variable	N	N (missing values)	% of missing values	MIN	MAX	MEAN	STD	SKEWNESS	KURTOSIS	PCTL_1	PCTL_2_5	PCTL_97_5	PCTL_99
Collection Period (before outlier analysis)	191503	55548	22.48	-950	2517752	262.96	9139.14	176.44	38888.17	1.402	4	538	1006,243
Collection Period (with outlier analysis)	191503	55548	22.48	4	538	131.56	115.3	1.657	2.98	4	4	538	538

(c) Monotonicity Criterion

The monotonicity of each variable (for continuous variables) is tested by the graphical representation of its values with respect to the observed population default rate.

The following graph shows the monotonous behaviour of the default rate with respect to the values of the financial ratio 'Financial Leverage' (the default rate increases as the ratio values increase).

Graph 2.2: Financial Leverage



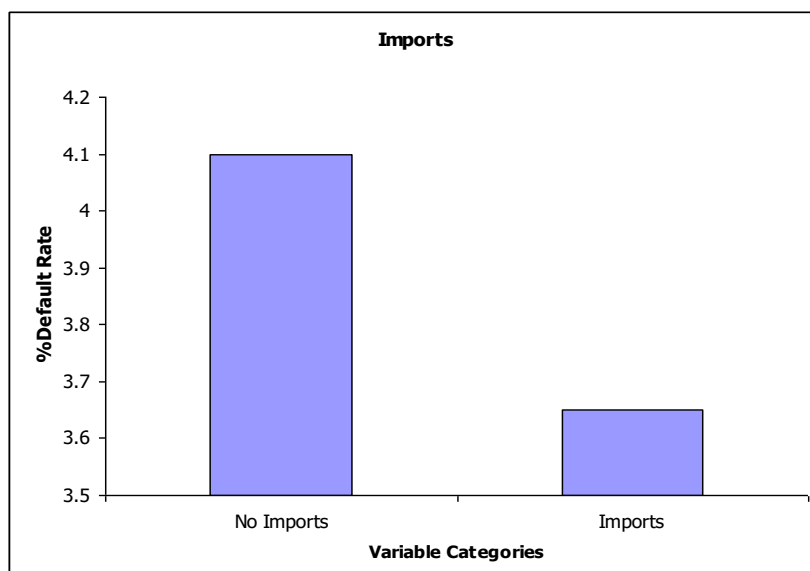
In case there are financial ratios with no monotonic behaviour with respect to default rate, which cannot be explained from an economic / business point of view, the ratios in question are excluded from the analysis.

In other cases, it is possible that certain variables (in particular for the dynamic ratios) produce a non-monotonous function with respect to default rate. In order to achieve the expected monotonicity an appropriate transformation of their values has to be applied. If no transformation is applied, the dynamic ratios in question would be less significant in explaining the default probability.

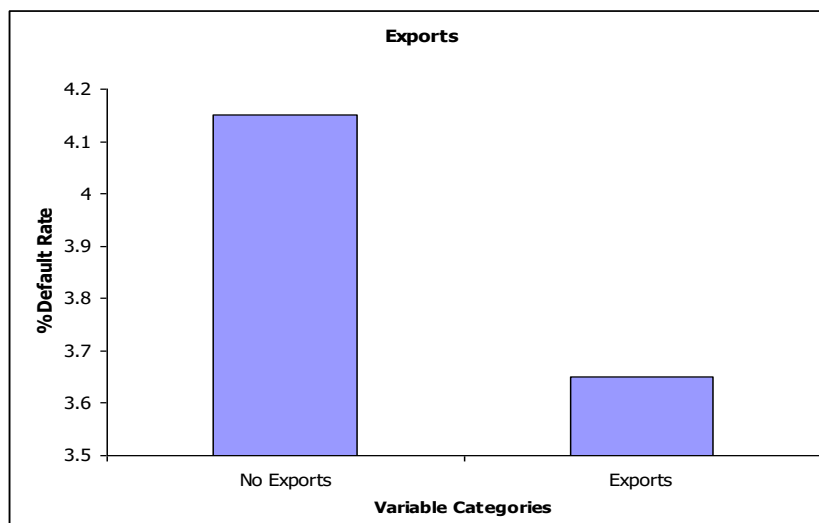
For the variables related to the commercial data, categories of their values (levels) are created. For these variables, the aim is to group their values in levels with a business interpretation, among which the default risk (percentage of default) is significantly different.

For example, the following two graphs report the percentage of default for the different levels of variables (a) Imports, and (b) Exports.

Graph 2.3: Imports



Graph 2.4: Exports



Following the analysis of the distribution values of the ratios, we conclude to a number of variables that for different reasons are excluded from the univariate analysis. These reasons could be either: (a) specific problems in some ratios' values, (b) ratios that provide no evidence of monotonicity in their values with respect to default rate or (c) insignificant differentiation of the default rate between the attributes of each nominal or ordinal variable.

The final step of the 'Initial selection' is the calculation of the correlation among the input variables under consideration. The correlation, negative or positive, is not desirable for variables that will be included in the final credit model. This information will be used in the multivariate analysis.

The Univariate Analysis result is a set of an initial group of input variables that will be used in the logistic regression (multivariate analysis) as independent variables.

2.3.3.2 Final Selection of Variables

Based on the univariate analysis results, an independent variable could show high statistical significance in predicting the default probability. However, the significance of one variable could decrease if it is examined along with other input variables. By using the multivariate logistic regression, the interactions and the correlations among the variables are taken into account. The optimal combination of independent variables resulted from the logistic regression model is derived by using the stepwise variable selection method.

The stepwise variable selection method selects in each step, one by one, the most significant variables among those not yet selected (Chi-square coefficient significance test), to enter the model. At the same time a test is performed on the variables already included in the model to determine whether they remain significant after the inclusion of the new variable. The process comes to an end when the Chi-square test is no longer satisfied for any entry (new) variable. The Chi-square coefficient statistical significance level for entry or removal of a variable in the logistic regression model is 5%.

The result of the above process is (a) the independent variables of the final model, (b) the estimation of their coefficients and (c) the resulted estimated default probability.

Furthermore, the correlation analysis is applied in the variables of the model. Since the logistic model should not contain variables that are either highly correlated or have the same business meaning, a selection between these variables is performed in intermediate steps and some of them are eliminated.

2.3.3.4 Macroeconomics Impact on Default Rate

The relation between the economic cycle and the default rate is considered as an important factor in the estimation of credit risk.

The examination of financial ratios in various phases of the economic cycle and the pertinent default rates reveal the procyclical nature of credit risk. In general, during recessionary periods the significant decline in turnover and profitability increases the pressure in companies' balance sheets due to the needs for liquidity and new capital. This need usually is not absorbed entirely by banks which reduce credit expansion for fear of increased cost of money and of bad debt. The above combination creates credit crunch conditions for companies and increases the default rates.

ICAP employs a methodology for the estimation of the impact of the economic cycle in Greek companies' default rates. ICAP's methodology is based on a linear regression model for the evaluation of the macroeconomic indicators found to be highly associated – have an impact to the default rates. Through this procedure, ICAP estimates the default rate for the next 12 months horizon.

Separate models were developed for the prediction of the default rate for each of ICAP's credit assessment models.

The prediction of the default rate (macroeconomic adjustment) is used for adjusting at the final step of the quantitative analysis the score assigned to the company from the logistic regression model.

2.3.3.5 Credit Ratings Development

The default probabilities calculated using the logistic regression models are adjusted according to the macroeconomics adjustments.

The resulted default probabilities are grouped into ten credit quality classes (credit ratings) according to the following criteria:

- There should be a considerable difference with clear increasing trend of the observed default rate as we move from high-quality credit ratings towards low-quality credit ratings.
- There should be an approximately symmetrical distribution of companies across the credit ratings (normal distribution).
- There should be a stability of the observed default rates across observation years of default for each rating class.
- Stability should be achieved over the one-year transition rates of the credit ratings (migration tables).

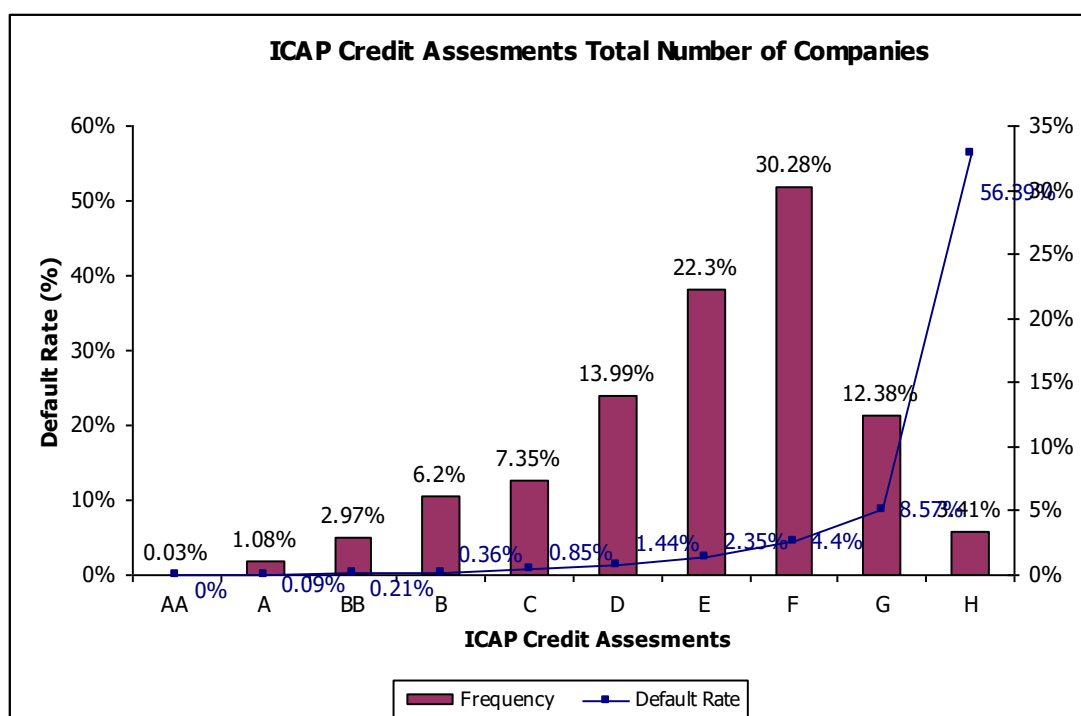
Considering all these criteria, the following credit-quality rating classes are constructed:

Table 2.10: Statistical Models Credit Ratings

Credit Ratings	Risk Level
AA	Low Risk
A	
BB	
B	
C	Medium Risk
D	
E	
F	High Risk
G	
H	

The following graph illustrates the distribution of companies across the credit ratings as well as the default rate observed in each rating class.

Graph 2.5: Credit Ratings Distribution



The graph illustrates the distribution of companies from the model development sample (period 2003-2011) across the credit ratings as well as the default rate observed in each rating class. There is a peak towards the medium and high risk rating classes due to the deterioration of the Greek economy in years 2010-2011.

2.4 Analyst Qualitative Assessment

The aim of the qualitative characteristics assessment by the Analyst is to ensure the quality and the accuracy of the credit rating assigned to the company through combining the quantitative credit rating with additional information – qualitative characteristics – of the economic unit.

In order to achieve this aim, a specific questionnaire of the qualitative characteristics is developed that ensures the integrity, independence and consistency of the Analyst's credit rating opinion regarding the creditworthiness of the economic unit.

The credit rating assignment process is executed from the responsible Analysts. Every Analyst reports to a Lead Analyst who supervises the procedures and approves the credit ratings.

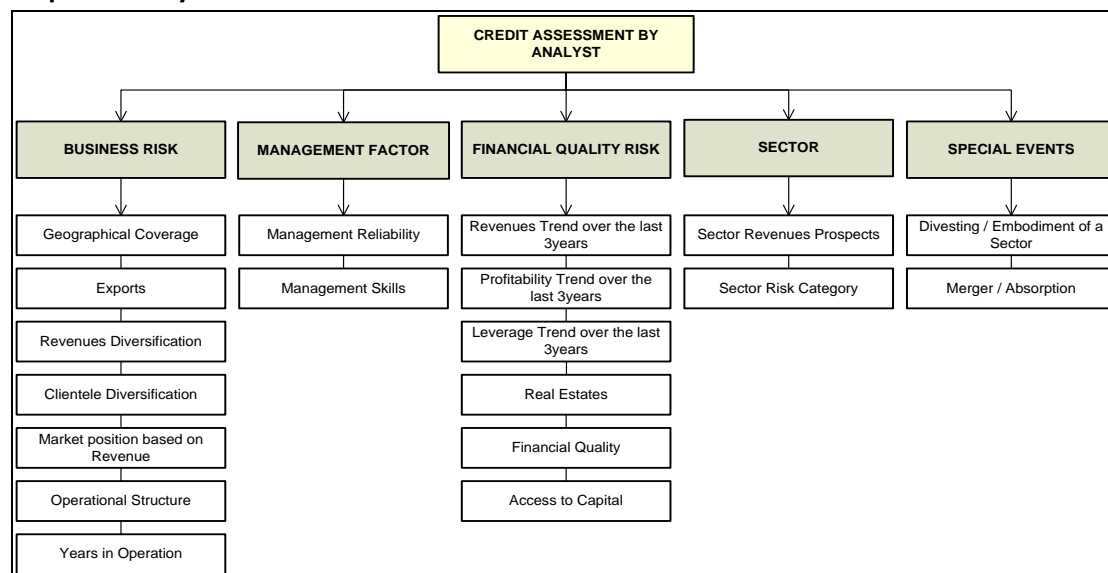
In order to clearly distinguish these evaluations from the ones which are not assessed according to the Regulation 1060/2009, these are indicated as Credit Ratings.

Following the international practices, ICAP's methodology focuses on specific rating criteria that can be grouped in five main categories based on the risk factors they assess:

- Business Risk
- Management Factor
- Financial Data Quality
- Industry Risk
- Special Cases

The flowchart below outlines the above process.

Graph 2.6: Analyst Credit Assessment Process



It is clear and should not be overlooked that the qualitative evaluation process and the in-depth investigation of the activity and the data of the entity concerned by the Analyst cannot be standardized in a questionnaire.

In this sense, the qualitative evaluation questionnaire operates in an ancillary manner, but provides a comprehensive picture of the criteria examined to ensure that the Analyst has not overlooked any of the essential risk fields that are evaluated according to ICAP's methodology.

2.5. Additional rating criteria that contribute to a consistent and documented configuration of the final credit rating

Following the completion of the above-mentioned steps, the Analyst by considering the outcome of the algorithm and the questionnaire, may also consider a number of criteria/factors that in his judgement affect his final opinion and shape the final score for the entity concerned. This process enables the Analyst to enhance the accuracy of the evaluation, that results from the algorithm and the questionnaire.

The criteria/factors that may be examined are derived from the overall analysis of the data and available information and are mentioned **indicatively and not restrictively** in the following four categories.

It is noted that the Analyst makes use of these criteria, where they are applicable and in no way can, in themselves, affect his judgement on the final proposed result of the evaluation.

A. Financial risk

1. Leverage and Solvency Ratios.
2. Working Capital and Liquidity.
3. Activity, turnover and profitability.
4. Quality of financial statements.

B. Business activity and risk factors

1. Transaction behavior.
2. Credit risk hedging measures.
3. Competitive market position.
4. Liquidity Assessment in terms of quality.
5. Shareholder financial support.

C. Corporate Governance

1. Quality of administration.
2. Frequent change of Financial Staff and Chartered Auditors.

D Examination of Special Events

1. Negative EBITDA (in the last 3 years, at least).
2. Existence of special derogatory data relating to the entity under review or to a major customer or to affiliates and subsidiaries that are reasonably believed to affect its activities.
3. Special events that substantially differentiate the financial position of the entity under review, from that reflected in the financial statements.
4. Existence of other exceptional financial events that affect the financial statements of the recent period of the entity under review, but based on data, shows that these were individual and have been removed.
5. Consistency of the company's behavior with the available business transaction data.
6. Consistency with Peer Group.
7. Group evaluation.
8. Evaluation of special factors in companies under the legal form General Partnership, Limited Partnership and in Sole Proprietorships.
9. Recent and additional financial information / Luck of recent financial data.
10. Development Perspective (from Business Plan or other documented sources).

2.6. Sensitivity Analysis

The purpose of this process is to identify the behavior and benchmarks of those critical factors that influence the definition of the final credit rating, both in the process of quantitative as well as in the process of qualitative evaluation and evaluation of additional criteria, by simulating stress scenarios.

More specifically, stress scenarios are simulated, which in the judgment and experience of the Analyst are likely to occur in the future (based on the current financial situation and the environment in which the rated entity is operating) and is analyzed the impact of these scenarios at all stages of the credit rating assignment procedure.

The result of the above process is to formulate scenarios that under certain conditions may either lead to the upgrade of the credit rating in comparison to the existing level or lead to a downgrade of the credit rating in a future reassessment. Part of the above conclusions are contained in the Analyst's explanatory report to the relevant approval step.

2.7. Final Credit Rating

When the Analyst completes the assessment of all criteria, the final credit rating can be decided as well as the stress scenarios (Sensitivity Analysis). The decision on the final credit rating is made by the Analyst who combines the result of the statistical algorithm, the result of the qualitative questionnaire along with the result of the examination of the qualitative characteristics including the additional rating criteria.

In any case, the credit rating decision is communicated and justified by the Analyst to the Lead Analyst, who in turn either agrees or disagrees with the Analyst's decision.

In case of agreement between the Analyst and the Lead Analyst, the credit rating is stored by the Analyst in ICAP's database accompanied by the appropriate justification and the rated company is notified about the result of the assessment.

In case of disagreement between the Analyst and the Lead Analyst, the decision on the company's credit rating is assigned to the Rating Committee. The Committee, after examining all available information, decides definitively on the credit rating of the company. Then, the credit rating is stored by the Analyst in ICAP's database accompanied by the appropriate justification and the rated company is notified about the result of the assessment.

Furthermore, the Rating Committee is responsible for the final credit rating in special cases. Indicatively in cases of mergers/absorptions, management changes affecting the company's status, cases of disagreements from the rated entity regarding the assessment and the provision of additional information.

Finally, an outlook is assigned to the rated company which is linked to the projections for the future course of the company's credit profile over the following 4 months based on the information currently available. This information reflects an evolving situation that may affect the examined company's credit rating. Outlooks may be assigned to all companies and applied across the entire rating scale (except the N.R., N.C. and N.T. categories).

It should be mentioned that the assignment of an outlook does not necessarily yield a change in the rating and that rating changes do not require in advance an assignment of the appropriate outlook. Furthermore, there is no restriction in the direction of the outlook change that may be performed during the review process.

Depending on the effect on the credit rating, the outlook of a company can be: Negative outlook, Positive outlook, Under surveillance.

APPENDIX: ICAP CREDIT RATING SCALE

AA	The AA-rating indicates the lowest credit risk and it is assigned to companies that are able to honor their obligations even under severe distressed conditions and therefore their credit worthiness is expected to continue to be very high. Companies rated with AA are characterized by exceptional financial strength, very strong business growth and important market position.
A	The A-rating indicates very low credit risk and it is assigned to companies that are able to honor their obligations even under severe distressed conditions and therefore their credit worthiness is expected to continue to be high. Companies rated with A are characterized by very strong financials, strong business growth and important market position.
BB	The BB-rating indicates very low credit risk and it is assigned to companies that are likely to be affected very marginally by severe distressed conditions and therefore their credit worthiness is expected to continue to be relatively high. Companies rated with BB are characterized by significant financial strength, stable business growth and competitive market position.
B	The B-rating indicates low credit risk and it is assigned to companies that are likely to be affected slightly by severe distressed conditions and therefore their credit worthiness is expected to continue to be relatively stable. Companies rated with B are characterized by satisfactory financial strength, stable business growth and relatively competitive market position.
C	The C-rating indicates moderate credit risk and it is assigned to companies that are sensitive to market and economic conditions and therefore their credit worthiness is expected to continue to be relatively stable. Companies rated with C are characterized by moderate financial strength and stable business level and relatively declining competitive market position.
D	The D-rating indicates relatively increased credit risk and it is assigned to companies that are rather sensitive to market and economic conditions. Companies rated with D are characterized by below average financial strength and negative business growth and declining competitive market position.
E	The E-rating indicates increased credit risk and it is assigned to companies that are very sensitive to market and economic conditions. Companies rated with E are characterized by low financial strength and substantially negative business growth and low competitive market position.
F	The F-rating indicates significantly increased credit risk and it is assigned to companies that have or are very likely to have in the short term a problem in honoring their financial obligation. Companies rated with F are characterized by significantly low financial strength and competitive market position
G	The G-rating indicates very high credit risk and it is assigned to companies with significant problems in honoring their financial obligation. Companies rated with G are characterized by encumbered financial strength that put in jeopardy their business.
H	The H-rating indicates the highest credit risk and it is assigned to companies with very significant problems in honoring their financial obligation. Companies rated with H are characterized by extremely encumbered financial strength that put in significantly jeopardy their business.

N.R.	Not Rated. The "NR" class does not constitute a rating grade and includes companies that cannot be rated.
N.T.	Not Trading. The "NT" class does not constitute a rating grade and includes companies that have ceased to operate.
N.C.	Not Calculated. The "NC" class does not constitute a rating grade and includes companies that cannot be calculated.

NOTE: Credit rating expresses an overall view on the financial position of the company and it should not be equated to the possible profitable or loss making financial outcome. Credit ratings do not constitute suggestions to buy, sell or hold of investment securities.

COMMUNICATION

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