MODEFINANCE TECHNOLOGIES:

MORE METHODOLOGY 2020

modefinance

agenda

- MORE SCORE
- RATING
- MORE RATING: RELEVANT INFORMATION

credit score

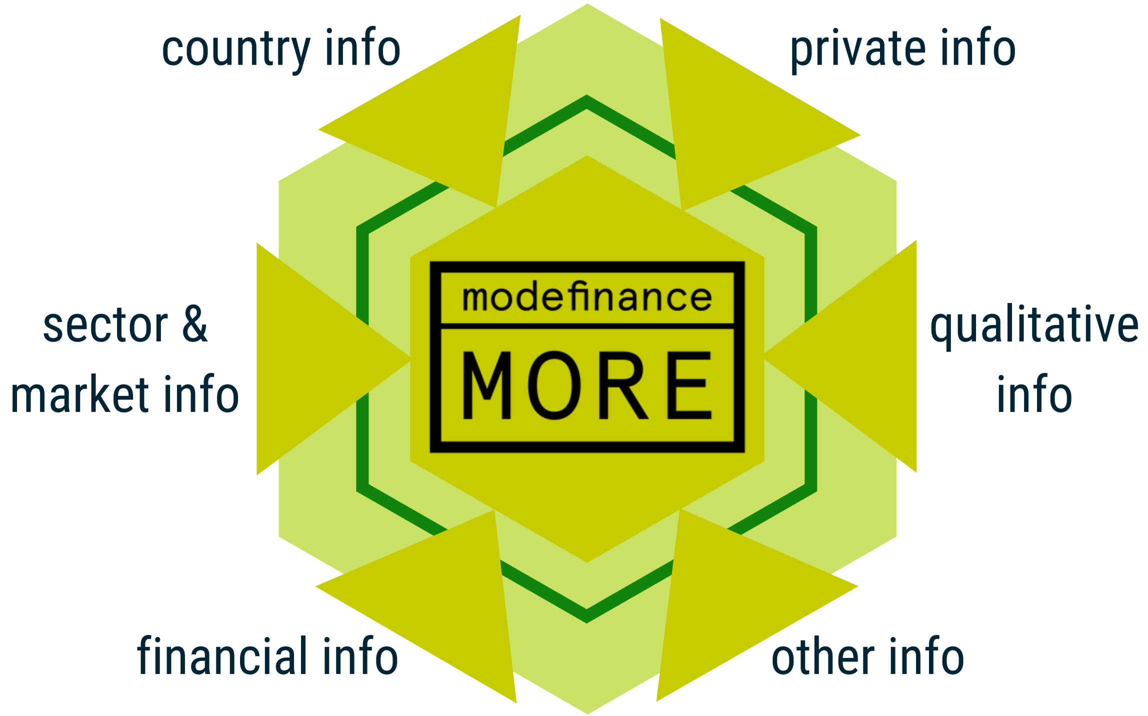
Credit score is an opinion of the economic and financial quality of a company, based on relevant risk factors.

A different probability of default (within one year, two years and three years) is associated with each rating class, shown by traditional symbols (AAA to D).

MORE score	Macro class	Assessment
AAA	Healthy companies	The company's capacity to meet its financial commitments is extremely strong.
AA		The company has very strong creditworthiness.
A		The company has a high solvency.
BBB	Balanced companies	Capital structure and economic equilibrium are considered adequate.
BB		The company's performances are adequate considering the sector and the country in which it is operating.
B	Vulnerable companies	The company presents vulnerable financial signals.
CCC		The company has a dangerous disequilibrium on the capital structure and on its economic and financial fundamentals.
CC	Risky companies	The company shows signals of high vulnerability.
C		The company shows considerable pathological situations.
D		The company no longer has the capacity to meet its financial commitments.

MORE score

MORE - Multi Objective Rating Evaluation – has been developed by modefinance to evaluate the economic quality and financial health of a company. MORE methodology is used by modefinance analysts as a fundamental basis for rating evaluation.



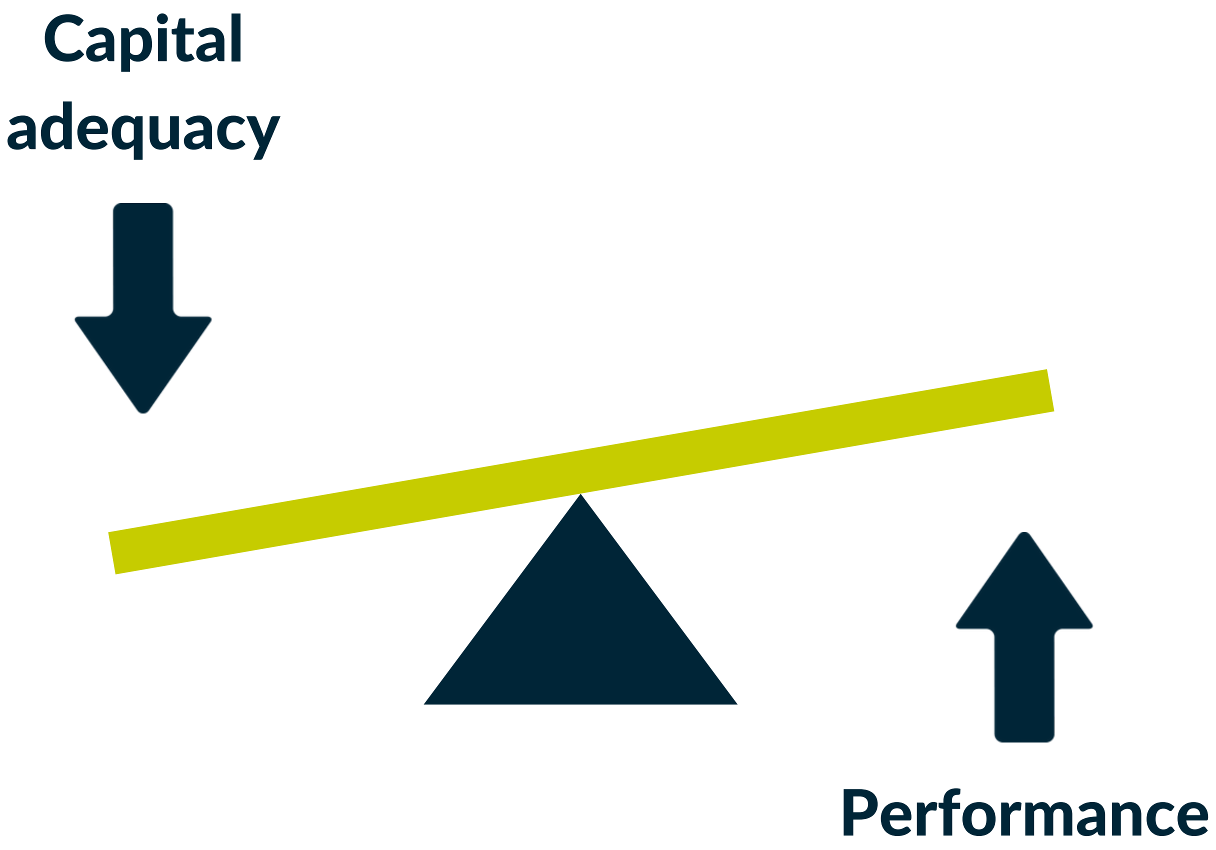
MORE permits the coherent and accurate integration of any company's information, to evaluate the accurate financial risk assessment, through financial accounts data analysis.

Results of the model are obtained by applying high-level numerical methodologies, drawing together financial theory, data mining and engineering design methodologies.

OBJECTIVITY TRANSPARENCY COMPARABILITY

MORE score

MORE evaluates the fundamentals and their equilibrium.



development steps

ratios definition and choice

from quantitative to qualitative definition

financial and economical equilibrium

MORE score

statistical analysis

Fuzzy Logic

Multi Criteria Decision Making (MCDM)

ratios definition and choice

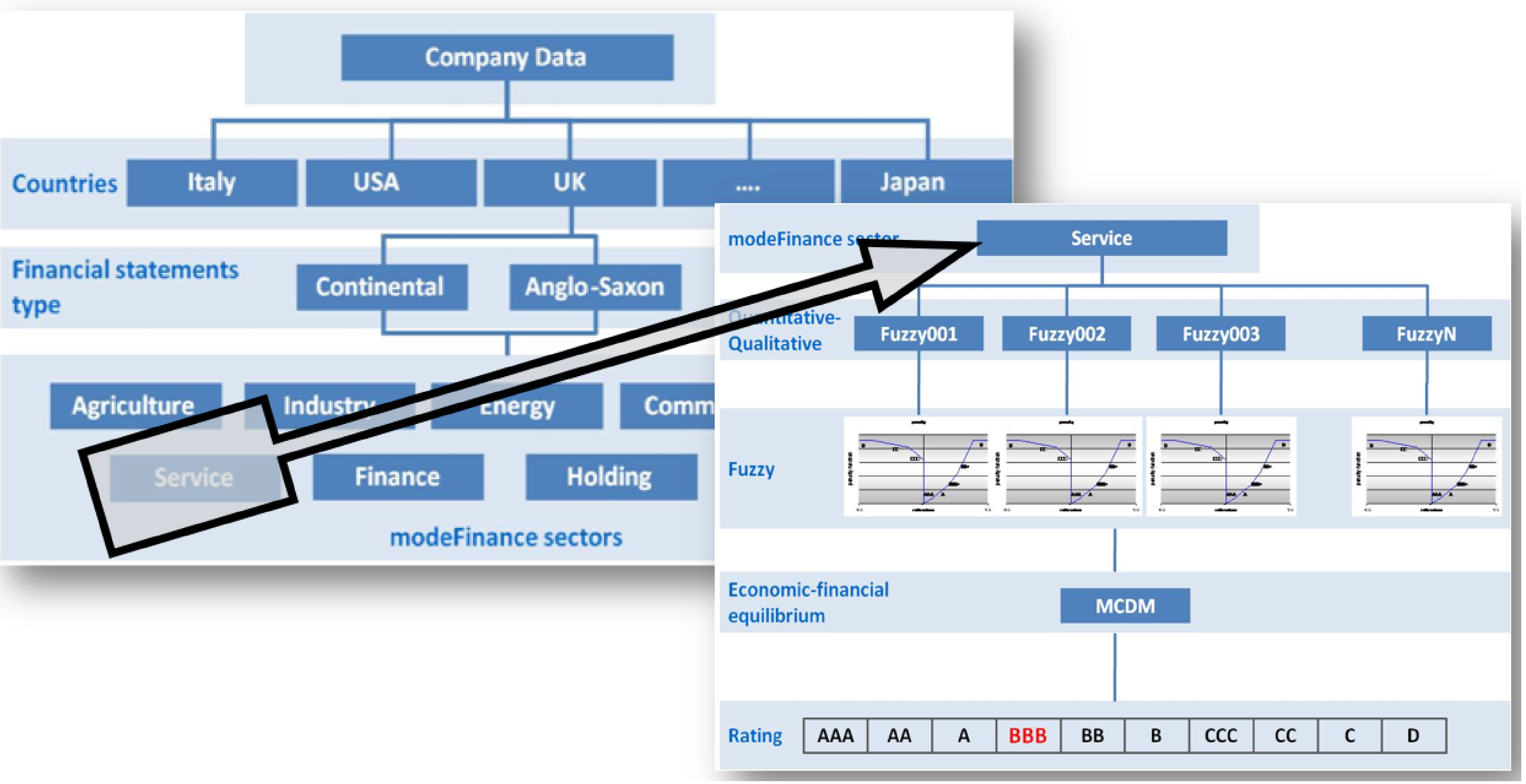
In order to assess a company's creditworthiness, it is fundamental to contextualize the analysis to the environment and background the company is working in.
You should consider the following factors:
- *The country*
- *The sector*
- *The available financial figures*

Furthermore, the ratios are chosen according to these 2 criteria:

- They must be **predictive** of default (study is done only in countries where there is enough information about defaulted companies);
- They must be **representative** of the financial and economic behaviors of a company. This is because the main idea of the MORE model is to give the score class as a picture of the financial and economic equilibrium belonging to the company.

ratios definition and choice

We divided the database into **9 sectors for each country** and according to **2 accounting systems** (anglosaxon and continental).



ratios definition and choice

By performing an accurate statistical analysis for each sector, which highlights the differences among the economies of different countries and accounting principles used, we then selected about **15 indicators** (changing from sector to sector).

Category:	Description:	Example:
Solvency ratios	Solvency ratios help investors assess a company’s ability to meet its long-term obligations. They also explain how the company has been financed (debt or equity).	Debt to equity; Debt to assets; ...
Liquidity ratios	These ratios are used to determine whether a company is able to pay off its short-term debt obligations.	Quick ratio; Current ratio; Cash cycle;
Profitability ratios	The profitability of a company depends not only on the margins generated, but also on the assets that must be employed to generate those profits.	ROE; ROI; ...
Interest coverage ratios	These ratios are used to determine how easily a company can pay interest on outstanding debts.	Ebit on interest paid; ... ...
Constraints on efficiency	modefinance sets many tests to check if the company is able to generate adequate margins from financial and operating management.	Financial P/L; P/L before or after tax; EBIT;

ratios definition and choice

According to such approach, the MORE model is not unique.

MORE is composed by more than 20.000 different models:

- 1 model for every country;
- 9 sectors for each country;
- 1 model for Anglo-Saxon and 1 for continental accounting;
- 1 model for every considered ratio (~15 per company);

development steps

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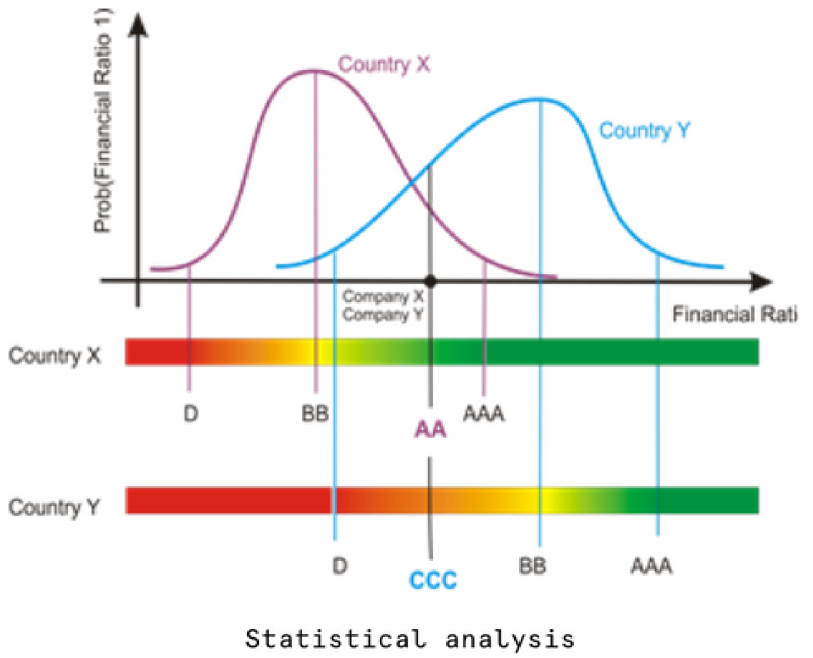
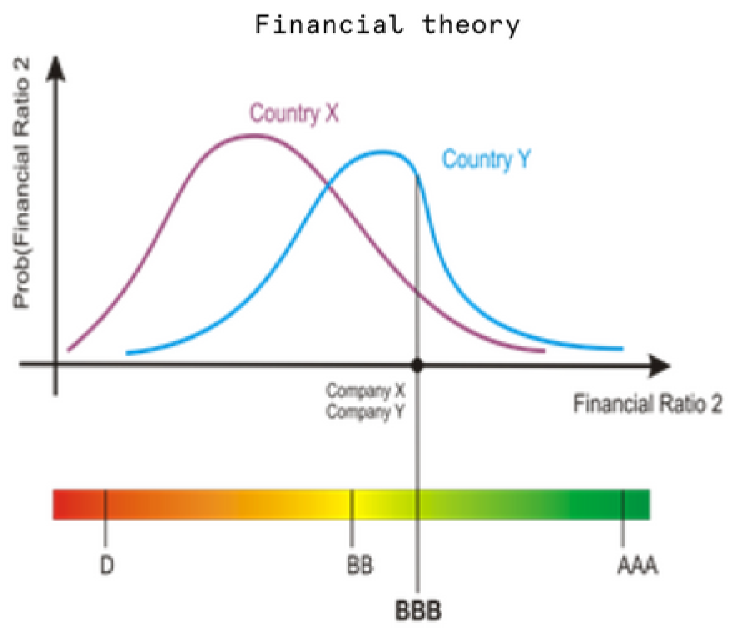
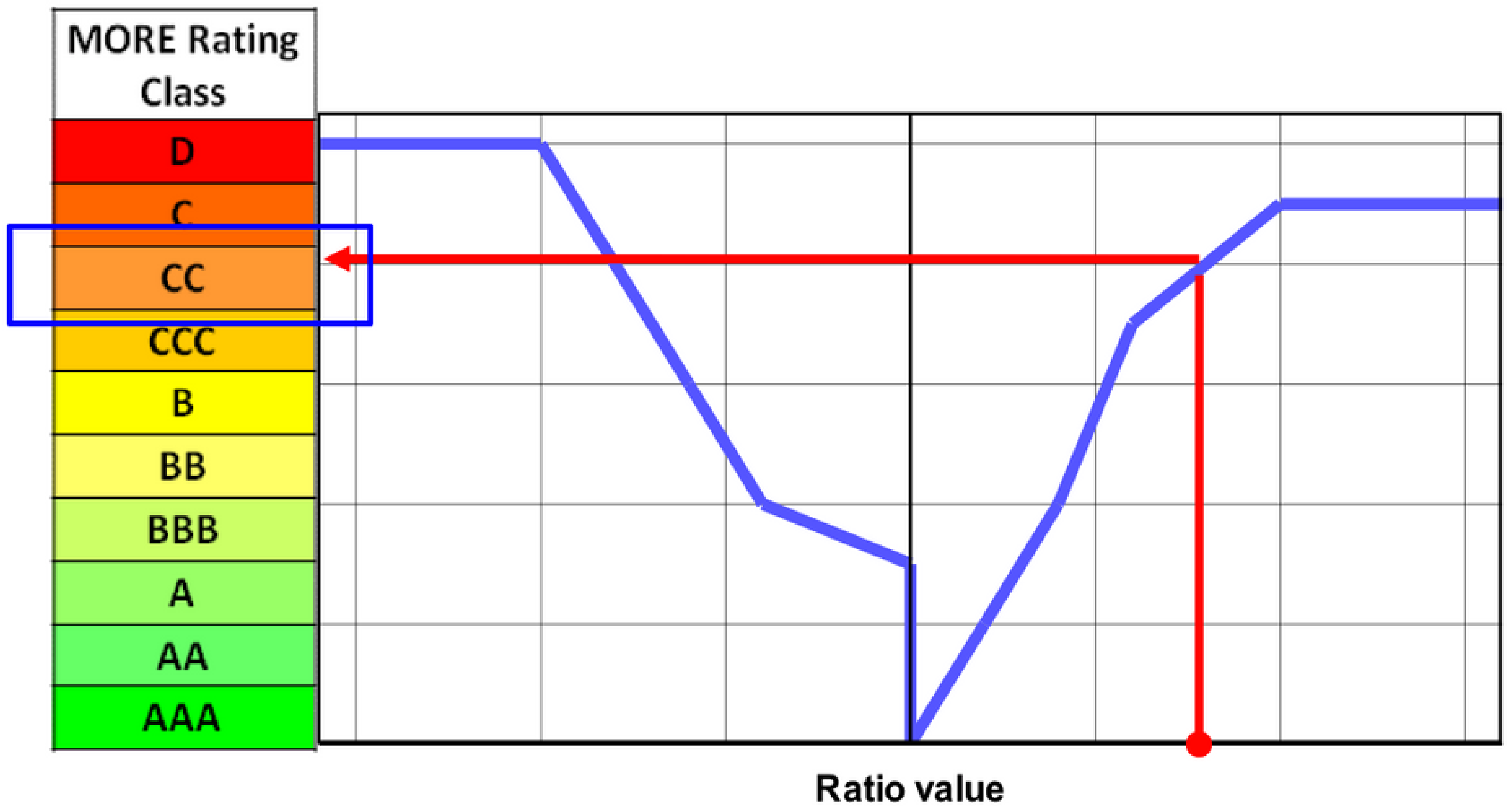
from qualitative to quantitative definition





Each ratio has been studied within the pertaining sector and country, through a statistical analysis, so it was possible to assess the distribution of each ratio.



According to such massive statistics and/or to financial theory, the ratio’s value is translated into a qualitative opinion, according to Fuzzy logic techniques. As you can see in the graph, each value has been assigned to a class, from the best (AAA) to the worst (D), transforming a number into an opinion.

This procedure is repeated for each ratio involved in the assessment.

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economic-financial equilibrium

Suppose we should rate 3 companies; suppose that each company could be characterized by 2 ratio's values (for example: ROI and Leverage) in a range [0 - 1] (where 0 is the worst and 1 is the best value).

Company	Ratio X	Ratio Y
ABC	1,0	0,4
XYZ	0,5	0,9
UVW	0,7	0,7

Which company is the best?
Which one is the worst?

Weighted sum:

Score ABC = 1,0+0,4 = 1,4
Score XYZ = 0,5+0,9 = 1,4
Score UVW = 0,7+0,7 = 1,4

It's impossible to decide: the 3 companies are equivalent!

MCDM:

MORE score ABC = 0,5884
MORE score XYZ = 0,6260
MORE score UVW = 0,7000

There is a difference among the companies:
It's possible to assert that **UVW > XYZ > ABC.**

development steps

ratios definition and choice

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from quantitative to qualitative definition

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financial and economical equilibrium

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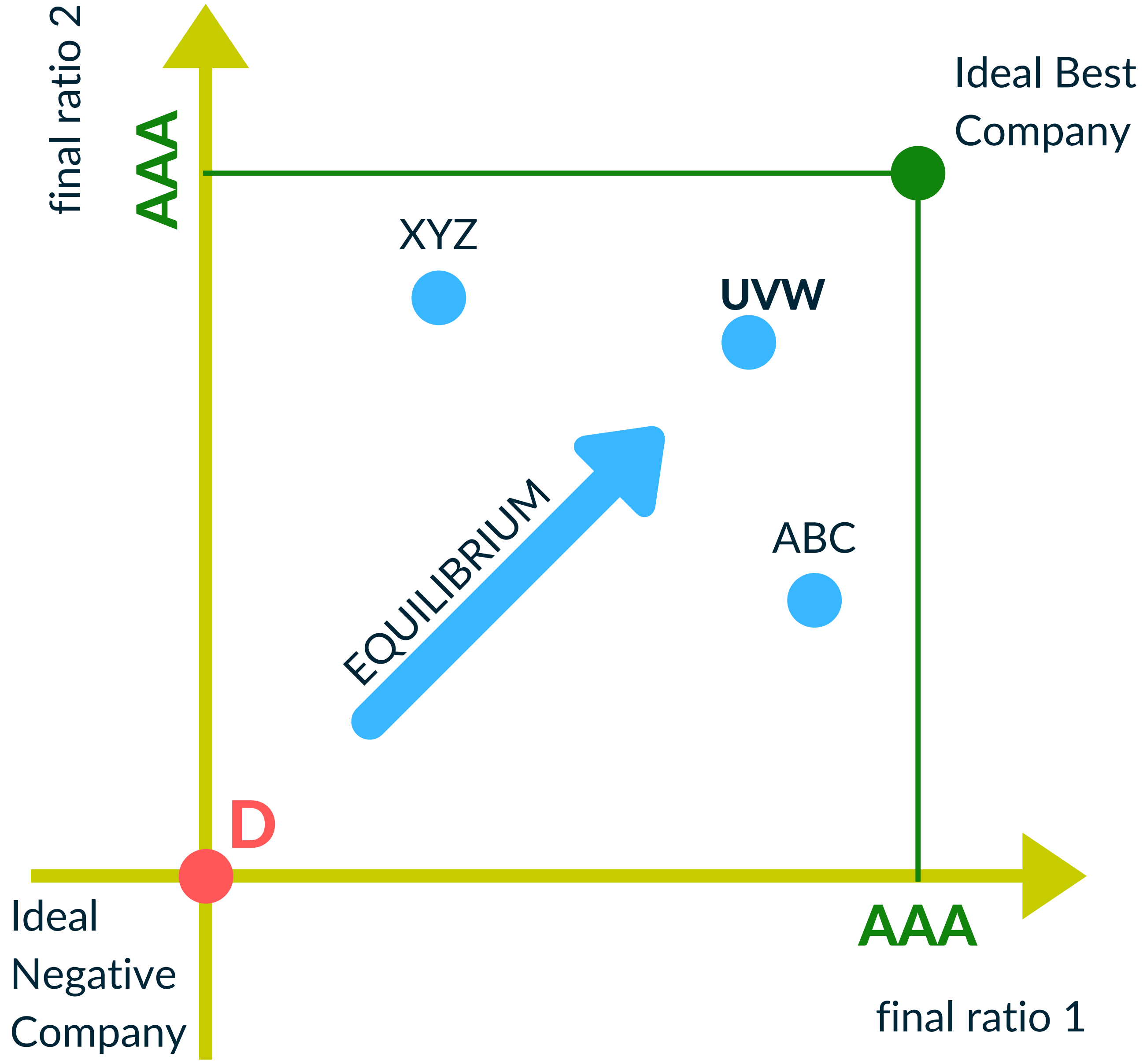
Multi Criteria Decision Making (MCDM)

score evaluation: MCDM



Company	Final ratio 1	Final ratio 2
ABC	GOOD	POOR
XYZ	POOR	GOOD
UVW	GOOD FINANCIAL EQUILIBRIUM	

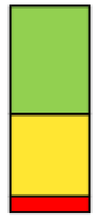
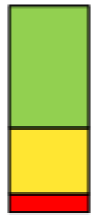
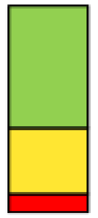
According to our view on a company, using MORE a multi-criteria support decision algorithm, **the better the equilibrium, the better the final rating.**

MORE score output: *financial strength*

MORE model has several outputs in order to ease the credit risk assessment.
To be more precise the main outputs are:

- the risk class;
- the probability of default;
- the confidence level;
- the opinion about the ratios' values. The colors of the dots correspond to our opinion about the ratio's value (remind *fuzzy translation*).

Company Financial Analysis

	31/ 12/ 2018	31/ 12/ 2017	31/ 12/ 2016
Turnover (th €)	2. 113. 651	2. 339. 562	2. 523. 292
Score (%)	77, 13	82, 22	81, 44
Probability of default (%)	0, 19	0, 15	0, 15
Confidence Level (%)	100	100	100
Solvency ratios			
Leverage ratio	0, 49	0, 36	0, 41
Financial leverage	0, 00	0, 00	0, 00
Total assets / Total liabilities	3, 04	3, 76	3, 46
Liquidity ratios			
Current ratio	4, 05	4, 09	3, 72
Quick ratio	3, 25	3, 21	2, 73
Cash cycle ratio	63, 00	40, 00	49, 00
Profitability ratios			
Return on investment ROI (%)	6, 49	11, 79	12, 74
Return on equity ROE (%)	7, 36	11, 96	13, 75
Asset turnover	0, 69	0, 85	0, 91
Gross Profit / Operating revenue	0, 15	0, 19	0, 18
Interest coverage ratios			
EBIT Interest coverage ratio	1. 4E03	1. 3E03	112. 09
EBITDA Interest coverage ratio	2. 2E03	1. 6E03	149. 70
Analysis and Trend of financial strength			

MORE score output: risk class

The risk class is the main output: it is modefinance's opinion about the creditworthiness of the company. The MORE model is used by modefinance analysts as a fundamental basis for the rating assessment activities.
The model gives the opportunity to assign a risk class to a company even without considering a complete data analysis and allows to process quality information.

It induces a better understanding of a company's strengths and weaknesses thanks to sophisticated data mining tools and taking into account the analysts' knowledge.
There is a risk class evaluation for every filed account: it is a picture of the financial and economic equilibrium of the company.

MORE score	Macro classi di score	Giudizio
AAA	Sana	La solvibiltà dell'impresa è ritenuta massima.
AA		L'impresa ha una solvibilità molto alta
A		L'impresa ha una solviblità alta
BBB	Equilibrata	L'equilibrio patrimoniale, finanziario ed eocnomico è considerato adeguato
BB		La performance dell'impresa è adeguata considerando il settore e il paese nei quali opera
B	Vulnerabile	L'impresa manifesta segnali di elevata vulnerabilità
CCC		L'impresa mpostra squilibri nella sua struttura patrimoniale, finanziaria ed economica
CC	Rischiosa	L'impresa mostra dei segnali di elevata vulnerabilità
C		L'impresa manifesta situaizoni patologiche considerevoli
D		L'impresa manifesta situazioni patologiche gravi

MORE score output: confidence level

We also warn the final user on how confident we are on the assessment: confidence level.

Profit & loss account			
Local registry filing/Unconsolidated	30/06/2012 USD	30/06/2011 USD	30/06/2010 [illegible]
	12 months Local GAAP D&B PCF	12 months Local GAAP D&B PCF	[illegible]
Operating revenue (Turnover)	21.905.202	17.634.443	11[illegible]
Sales	n.a.	n.a.	[illegible]
Costs of goods sold	n.a.	n.a.	[illegible]
Gross profit	21.905.202	17.634.443	11.554.678
Other operating expenses	n.a.	n.a.	1.952.143
Operating P/L [=EBIT]	n.a.	n.a.	9.602.535
Financial revenue	n.a.	n.a.	n.a.
Financial expenses	n.a.	n.a.	n.a.
Financial P/L	n.a.	n.a.	0
P/L before tax	n.a.	n.a.	9.602.535
Taxation	n.a.	n.a.	n.a.
P/L after tax	n.a.	n.a.	9.602.535
Extr. and other revenue	n.a.	n.a.	n.a.
Extr. and other expenses	n.a.	n.a.	n.a.
Extr. and other P/L	n.a.	n.a.	n.a.
P/L for period [=Net income]	21.200.135	15.662.996	9.602.535
Export revenue	n.a.	n.a.	n.a.
Material costs	n.a.	n.a.	n.a.
Costs of employees	n.a.	n.a.	n.a.
Depreciation & Amortization	n.a.	n.a.	n.a.
Interest paid	n.a.	n.a.	n.a.
Research & Development expenses	n.a.	n.a.	n.a.
Cash flow	n.a.	n.a.	n.a.
Added value	n.a.	n.a.	n.a.
EBITDA	n.a.	n.a.	n.a.

modeFinance credit risk analysis	30/06/2012	30/06/2011	30/06/2010
MORE evaluation			
Class	AA	AAA	AAA
Probability of default (%)	0,08	0,05	0,05
Confidence level (%)	68	68	72

$$Confidence\ Level = \frac{\sum Available\ Information}{\sum Total\ Information}$$

MORE score output: probability of default

The Probability of Default (PD) is computed by using the Transition Matrix theory.

modeFinance credit risk analysis			
	30/06/2012	30/06/2011	30/06/2010
MORE evaluation			
Class	AA	AAA	AAA
Probability of default (%)	0,08	0,05	0,05
Confidence level (%)	68	68	72

We define as (technical) default the state of a company rated CC or lower (that means the company is distressed). By observing the evolution of every rating class in every country it is possible to assess the "probability of being distressed" PD.

For example, in France the PD of a CCC company is 19% because we observed that every 1000 companies, after one year, the score has changed according to the following schema:

1000 companies rated CCC

460 upgraded their score

350 remained stable

190 downgraded to unsustainable levels (below CCC)

MORE score output: sector analysis

Twice a year, modefinance collects all of the last scoring assessed in every sector and in every country and evaluates the “average of ratings and PDs”.

Those values are useful for comparing the analyzed company with its own peer group.

Sector Analysis

	Company	Healthy	Balanced	Vulnerable	Risky
Solvency ratios					
Leverage ratio	5.42	0.51	1.63	3.76	1.25
Financial Leverage	3.03	0.12	0.62	2.15	5.54
Total asset/Total liabilities	1.18	2.96	1.62	1.23	1.00
Liquidity ratios					
Current Ratio	1.03	2.01	1.18	0.87	0.52
Quick Ratio	0.85	1.64	0.90	0.58	0.38
Cash Cycle Ratio	62.00	-8.50	-2.00	10.00	17.00
Profitability ratios					
Return on investement ROI (%)	2.90	16.82	6.90	2.77	-8.54
Return on equity ROE (%)	1.11	19.51	11.69	2.11	-70.88
Asset turnover	0.96	1.71	1.58	1.39	1.26
EBITDA/Sales	0.08	0.12	0.07	0.05	-0.02
Interest Coverage ratios					
EBIT interest coverage ratio	1.85	204.80	7.67	1.30	-6.15
EBITDA interest coverage ratio	5.08	177.80	18.50	4.18	-1.79
Cash Conversion Cycle (days)					
Days Sales Of Inventory (DIO)	31	14	15	21	23
Days Sales Outstanding (DSO)	92	33	40	41	36
Days Payable Outstanding (DPO)	94	24	31	43	51
Cash Conversion Cycle (DIO + DSO - DPO)	29	28	31	34	32
Number of analyzed companies	**-**	**445**	**742**	**439**	**116**
(Average) Rating	**B**	**AA**	**BBB**	**B**	**CC**

agenda

- MORE SCORE
- RATING
- MORE RATING: RELEVANT INFORMATION

> “Credit rating means an opinion regarding the creditworthiness of an entity, a debt or financial obligation, debt security, preferred share or other financial instrument, or of an issuer of such a debt or financial obligation, debt security, preferred share or other financial instrument, issued using an established and defined ranking system of rating categories.”

Regulation (EC) N. 1060/2009 of the European Parliament and of the Council, 16 September 2009 on Credit Rating Agencies.

"Credit ratings, as defined in Article 3(1)(a) of the CRA Regulation, include quantitative analysis and sufficient qualitative analysis, according to the rating methodology established by the credit rating agency. A measure of creditworthiness (score) derived from summariszing and expressing data based only on a pre-set statistical system or model without additional substantial qualitative rating-specific analytical input from a rating analyst should not be considered as a credit rating."

ESMA guidelines on the scope of the regulation.

rating types

public rating

every entity can access the rating evaluation according to subscribers's pay methodology (*membership*).

private rating

only few people can access the rating, specifically identified within the agreement between the entity and modefinance. Under no circumstances the rating will be published.

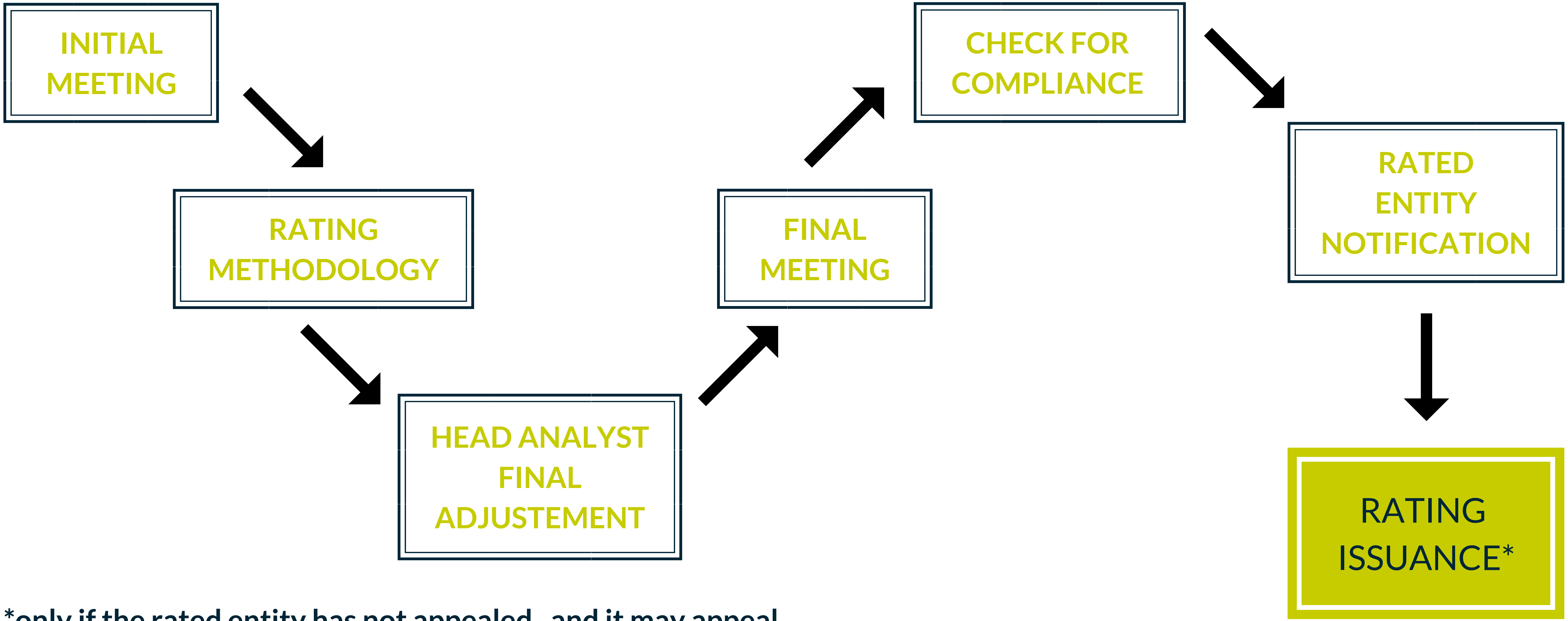
unsolicited rating

the rating evaluation is requested by a third entity (company B) which is not the same as the entity object of the rating assessment (company C).

solicited rating

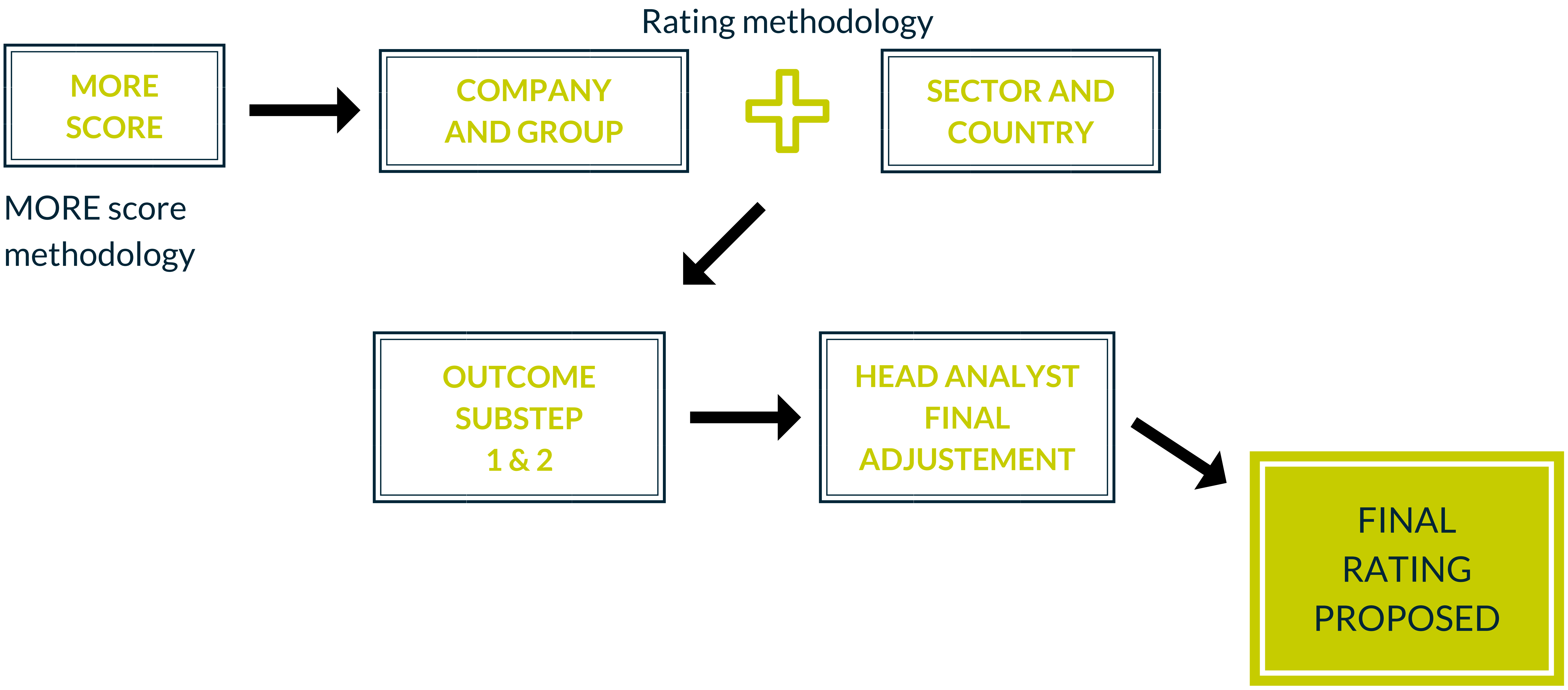
the entity that requests the rating (company A) and the subject evaluated in the rating assessment (company A) are the same.

issuance of credit ratings



*only if the rated entity has not appealed, and it may appeal only if the rating presents factual errors.

rating evaluation process



agenda

- MORE SCORE
- RATING
- MORE RATING: RELEVANT INFORMATION

MORE rating methodology: relevant information

The analysts have to check if the following conditions are met before proceeding with analysis:

- The last annual account is not older than 20 months *(i.e. it is possible until August 20XX+2 to refer to financial figures of 20XX/12/31st)*.
- The financial figures (annual accounts) filed for the last two fiscal years are available and updated, and the following financial items are available for both years (*minimum requirements: shareholders' funds; total assets; current assets; current liabilities; sales/operating revenues; EBIT; profits/losses for the period*).
- The figures are in thousands of euros. When filed in a different currency, the analyst has to apply the nearest exchange rate to the year end date of the financial accounts using the EUR as a cross-referencing point. The IMF is the official source of information.
- It is clear the main country of the company, the trade description and the sector activity code (NACE code or similar), major shareholders.
- The financial figures show no sign of probable factual errors or discrepancies such as unbalances between total assets and total liabilities and equity, total revenues and total costs and net profits.

Moreover, the analysts have to respect the following: the consolidated account is preferred when several accounts are available; the interim reports are collected and analyzed (quarters) when available.

substep 1: company and group

According to the rating methodology (modefinance P&P *“B. Issuance of credit ratings” step f*, *chapter V*), the assessment carried out in this phase is grouped in the following substep:

- Entity's size
- Longevity and legal status
- Governance & group analysis (shareholders and first-level subsidiaries)

Main inputs of this phase are official and public information by the textual parts of the annual accounts (explanatory notes). In those parts the focus is on the potential source of risk that are not evident from a numerical analysis.

substep 2: industry and country

According to the *rating methodology*, the assessment carried out in this phase is grouped in the following substep:

- Trend of the industry’s creditworthiness
- Impact of relevant news on the industry
- Influence of macro-economic conditions on the company
- Influence of the political risk on the company
- Impact of relevant news on the country

Concerning the macro economic conditions, the following aspects are considered: scale of the economy; GDP growth and volatility; national income; inflation level and volatility; general government gross debt; current account balance.

substep 3: final adjustment

The final adjustment represents the effect of a final overall assessment of the entity performed by analysts.
In this section the modefinance analyst could increase/decrease the rating by one class, or keep it unchanged from the previous step.

MORE rating methodology: outcome of the process

The outcome of substep 1 (company and group) is then the result of an analyst assessment and it consists in a value between -0.1 and +0.1 (negative values reduce the credit score and therefore may lead to a higher rating class, meaning less credit risk is attributed to the entity, and viceversa).

The outcome of substep 2 (industry and group) as well is the result of an analyst assessment and it consists in a further value between -0.1 and +0.1 (negative values reduce the credit score and therefore may lead to a higher rating class, meaning less credit risk is attributed to the entity, and viceversa).

The sum of the two values is added to the MORE Scoring obtained in the previous steps of the rating process and then mapped to a provisional modefinance Rating Class.

The outcome of substep 3 (final adjustement) will be the basis of the rating proposal of the analysts and will depend on the designated analyst overall assessment of the entity. In substep 3 the analyst is allowed to change the provisional modefinance Rating Class as attributed until substep 2 by maximum one modefinance Rating Class, upwards or downwards. The analyst is also allowed to leave the provisional modefinance Rating Class unchanged from the result of the previous substeps.

MORE rating methodology: outcome of the process

The following is the direct assignment score table:

Value	Description
-10%	There are clear and provable evidences the qualitative factor can (or will) positively influence the creditworthiness of the company.
-8%	There are very strong possibilities the qualitative factor can (or will) positively influence the creditworthiness of the company.
-6%	The qualitative factor has a positive effect on the creditworthiness of the company.
-4%	The qualitative factor has a slightly positive effect on the creditworthiness of the company.
-2%	The qualitative factor could have a slightly positive effect on the creditworthiness of the company.
0%	The qualitative factor doesn't have an effect on the creditworthiness of the company OR the factor is not applicable to the analysis.
+2%	The qualitative factor could have a slightly negative effect on the creditworthiness of the company.
+4%	The qualitative factor has a slightly negative effect on the creditworthiness of the company.
+6%	The qualitative factor has a negative effect on the creditworthiness of the company.
+8%	There are very strong possibilities the qualitative factor can (or will) negatively influence the creditworthiness of the company.
+10%	There are clear and provable evidences the qualitative factor can (or will) negatively influence the creditworthiness of the company.

MORE rating methodology: *important warnings*

In addition to the general considerations described above, the analysts have always the possibility to detect whether particular and important conditions of the factors under analysis may imply radical and exceptional influence on the entity's creditworthiness and therefore deserve special treatment.

In any of these circumstances, the analyst is required to flag an *important warning*, summarizing the relevant factors as well as their influence to the creditworthiness of the entity under rating, and saving the relevant documents and sources of information.

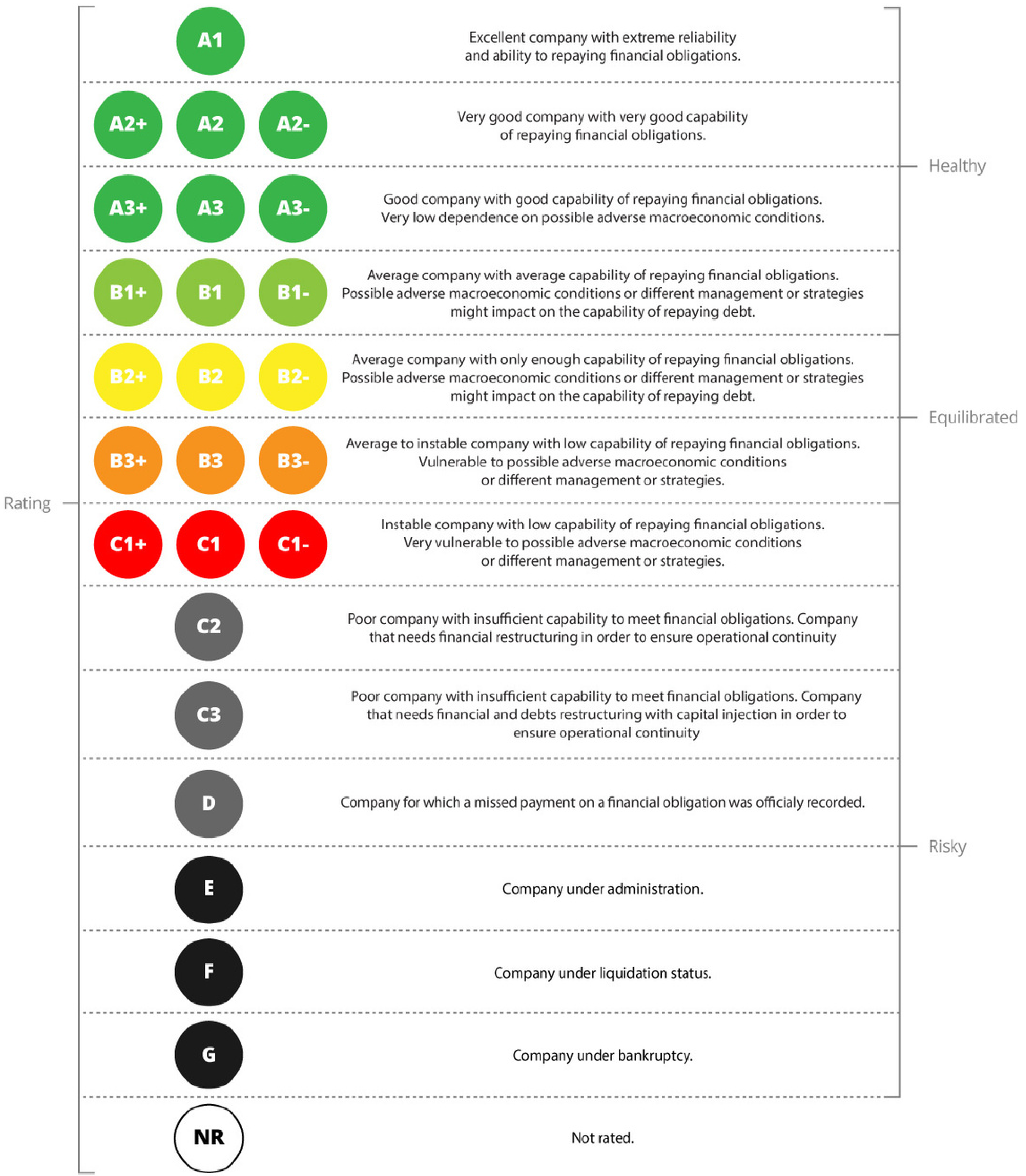
Important warnings are useful to be considered by the final rating team when taking the final decisions on rating as of *step h* of processes of issuance and review of credit ratings. In the final meeting of the rating team, the team may confirm proposed rating (at majority), override steps of the process and approve a different rating (only with unanimity), or let the rating be not issued or withdrawn (otherwise).

rating scale

Classe di merito di credito, standard	1	2	3	4	5	6
modefinance						
	A1, A2	A3	B1	B2	B3	C1, C2, C3, D
Moody's						
	Aaa, Aa	A	Baa	Ba	B	Caa, Ca, C
Fitch						
	AAA, AA	A	BBB	BB	B	CCC, CC, C
Standard & Poor's						
	AAA, AA	A	BBB	BB	B	CCC, CC, R, SD/D

https://eur-lex.europa.eu/eli/reg_impl/2018/634/oj

For all the information, please visit cra.modefinance.com



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