

creditsafe[®]

Creditsafe Norway

Generic Scorecard B2B

Executive Summary

Group Analytics

POWERING BUSINESS DECISIONS

Executive Summary

Creditsafe Norway Generic Scorecard Overview

In order to improve and increase Creditsafe's presence in the Norwegian marketplace a new generic suite of scorecards have been developed internally by Creditsafe Group Analytics.

Creditsafe is continuously working on improving its credit scores, using the latest knowledge in the field of statistical scoring methods and optimizing and maximizing the deployment of the ever-expanding database. This enables more and more relevant data from different processes and ensures that Creditsafe is utilising the most up to date and relevant information available for the Norwegian market. By this, the way companies are scored is improved making better and more predictive assessments about a growing number of companies, even in cases where less information is available.

Scorecards and Segmentation

Creditsafe's scoring methodology is a commitment to accurately predict business behaviour over the upcoming 12 months, using a wide set of characteristics that clearly identify why a business is considered to be high or low risk.

To augment the discriminative power of the scorecard solution, a strategic segmentation process was executed. The primary objective of segmentation was to delineate distinct sub-populations, each modelled to the overall population.

The key criteria for segmentation was the size of the company, predominantly determined by the total asset levels. Additionally, four specialized scorecards were developed for companies that are not Limited/Public limited companies and one for companies within Real Estate.

The following segments were defined and modelled accordingly:

With financial accounts and Limited/Public limited companies

1. Micro
2. Small
3. Medium
4. Large

Specialized Scorecards

5. New Companies (Limited/Public limited companies without accounts)
6. Real Estate
7. Low Risk (Housing cooperative/Condominium flat owner/Foundation)
8. General Partnership (ANS)
9. General Partnership with shared liability (DA)

Individual PD (Probability of Default)

The Probability of Default (PD) is a quantitative measure assessing the likelihood that a business will fail to meet its financial obligations and turn into the insolvency process within 12 months from the day of credit assessment. Creditsafe's scorecard employs a comprehensive rating scale, ranging from 1 to 100, where higher scores indicate lower risk and vice versa. This scale is derived from the individual PD calculated by the scoring algorithm.

This PD is meticulously crafted based on a unique combination of company-specific characteristics. Unlike the previous approach, where scores were directly matched, the conversion process will now feature a range of PDs per score. By maintaining the PD at a company level, this refined methodology provides a more nuanced and accurate risk assessment, empowering users with a granular understanding of the creditworthiness of each company.

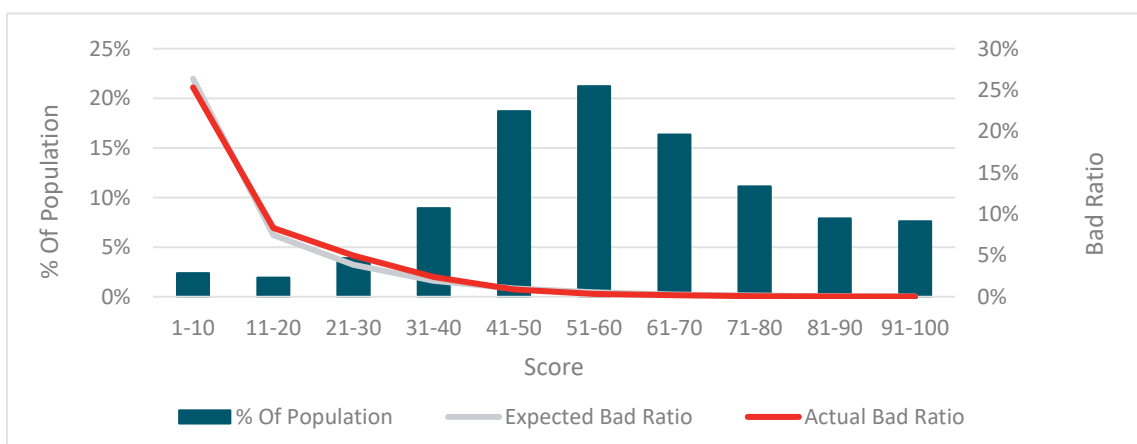
Summary of results

Population matrix for Limited and Public limited companies with financial accounts:

Risk Class	Min PD	Max PD	Min Score	Max Score	Expected Bad Ratio	Actual Bad Ratio	% Of Population
A	0,00%	0,18%	71	100	0,08%	0,06%	27%
B	0,18%	0,71%	51	70	0,40%	0,28%	38%
C	0,71%	3,00%	30	50	1,33%	1,40%	28%
D	3,00%	5,51%	21	29	3,99%	5,14%	3%
D	5,51%	100,00%	1	20	17,97%	17,83%	4%
Total					1,45%	1,45%	100%

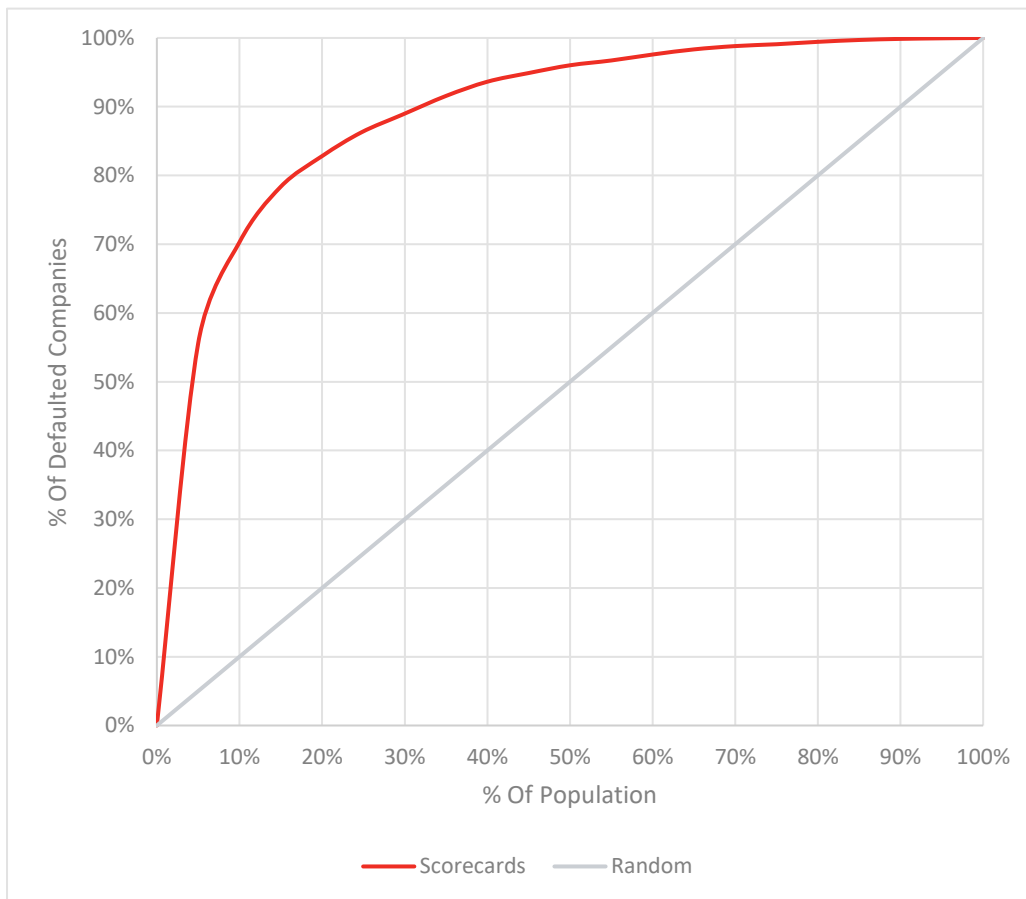
The population matrix above describes the international score bands, probability of default (PD), the associated min and max scores as well as the expected and actual bad ratios and the population distribution.

The distribution of the scores for limited/public companies with financial accounts is described in the chart below where the X-axis corresponds to the actual scores in groups of ten, left Y-axis is equal to the population distribution and the right Y-axis is equal to the bad ratio.



Predictive power & Gini Coefficient

In assessing the predictive power of Creditsafe's scorecards, the Gini coefficients emerge as a compelling measure of discrimination, showcasing exceptional performance across diverse segments within the Norwegian company population.



The graph above describes the percentage of the population, limited/public companies with financial accounts, with the highest risk finding the percentage of the defaulted companies. That means, in the graph above, that 10 percent of the companies with the highest risk find 70 percent of all the defaulted companies. The Gini coefficient, a key indicator to measure the predictive power of the scorecards, attains levels of up to 80, demonstrating the remarkable predictive power of Creditsafe's scorecards across various segments.

Validation and continuous monitoring

Creditsafe's commitment to scorecard robustness is underscored by a continuous monitoring and validation process. The ongoing validation efforts serve to fortify the scorecards' reliability, ensuring they consistently meet the high standards set by the organization.

Data preparation & Population Design

Sample design Overview

The basis for Creditsafe’s scorecards is a carefully designed sample of Norwegian data extracted from the organisation's extensive data pool. The design of the sample follows the following principles:

- *Economic Activity Recognition*: The generic sample is tailored to identify economically active companies, ensuring there is a robust foundation for scorecard development.
- *Exposure Period Consistency*: Each business within the sample is allocated a 12-month exposure period, allowing for the reliable assignment of business performance.
- *Mitigating Seasonality*: The sample window spans a full year to mitigate the impact of seasonality on business performance assessments.
- *Representative Time Frame*: The sample window is recent enough to be representative of the future Norwegian population, ensuring the scorecards remain relevant.

The scorecard development sample was created by taking business information from the 30th of September 2022 back to the 30th of September 2017, giving 5 years of information. A 12-month outcome period was then used from the 1st of October 2022 to the 30th of September 2023 to assign the good/bad population.

Definition of defaulted companies

The default definition for the Norwegian scorecard development is described below.

Defaulted	<ul style="list-style-type: none"> • Commencement of bankruptcy proceedings / bankruptcy • Insolvency and/or composition • Forced liquidation • Reconstruction <p>Within a 12 month period of the observation date.</p>
Not Defaulted	None of the above

Scorecard Development

Modelling Methodology

Stepwise Logistic Regression has been used to develop the scorecards. This is the preferred methodology within Creditsafe. Logistic Regression has the benefit of outputting a predicted probability to be bad in the next 12 months.

The principles of logistic regression also enable us to explain, due to the algorithm behind the calculation, the exact reason why the specific company get a certain probability of default.

Checking Business Logic

Even if a variable has predictive power, it is still necessary to check that its relationship with the outcome is logical and as expected. The first check on business logic therefore will be performed during the univariate analysis, discarding the variables that are not suitable from a business perspective.

It is necessary however to perform another overall check of the model resulting from the regression. If the analysis had been performed correctly the model should be predictive and correct from a mathematical point of view. It is still necessary to check its validity from the business point of view.

Scorecard Calibration

The logistic model generates individual Probability of Default (PD) values for each company and model. These PDs are subsequently transformed into a 1-100 Creditsafe score using the "double the odds" principle, e.g. that with every decrease of 10 score points, the PD increases with factor 2.

The chosen value for the transformation aligns the Creditsafe score with the PD at the required point. Moreover, it ensures synchronization with the score distribution anticipated by the Norwegian market, optimizing relevance and utility.

The resulting Creditsafe score serves as a direct and transparent representation of the underlying Probability of Default. This alignment provides users with a clear and accessible measure, facilitating a comprehensive assessment of a credit:

Probability of Default

Score		Min PD		Max PD	Band	Score		Min PD		Max PD	Band
100	>	0.0000%	<=	0.0233%	A	50	>	0.7086%	<=	0.7594%	C
99	>	0.0233%	<=	0.0250%	A	49	>	0.7594%	<=	0.8139%	C
98	>	0.0250%	<=	0.0268%	A	48	>	0.8139%	<=	0.8723%	C
97	>	0.0268%	<=	0.0287%	A	47	>	0.8723%	<=	0.9347%	C
96	>	0.0287%	<=	0.0308%	A	46	>	0.9347%	<=	1.0017%	C
95	>	0.0308%	<=	0.0330%	A	45	>	1.0017%	<=	1.0734%	C
94	>	0.0330%	<=	0.0354%	A	44	>	1.0734%	<=	1.1501%	C
93	>	0.0354%	<=	0.0380%	A	43	>	1.1501%	<=	1.2323%	C
92	>	0.0380%	<=	0.0407%	A	42	>	1.2323%	<=	1.3202%	C
91	>	0.0407%	<=	0.0437%	A	41	>	1.3202%	<=	1.4143%	C
90	>	0.0437%	<=	0.0468%	A	40	>	1.4143%	<=	1.5151%	C
89	>	0.0468%	<=	0.0502%	A	39	>	1.5151%	<=	1.6229%	C
88	>	0.0502%	<=	0.0538%	A	38	>	1.6229%	<=	1.7382%	C
87	>	0.0538%	<=	0.0577%	A	37	>	1.7382%	<=	1.8616%	C
86	>	0.0577%	<=	0.0619%	A	36	>	1.8616%	<=	1.9936%	C
85	>	0.0619%	<=	0.0664%	A	35	>	1.9936%	<=	2.1347%	C
84	>	0.0664%	<=	0.0712%	A	34	>	2.1347%	<=	2.2856%	C
83	>	0.0712%	<=	0.0763%	A	33	>	2.2856%	<=	2.4468%	C
82	>	0.0763%	<=	0.0818%	A	32	>	2.4468%	<=	2.6192%	C
81	>	0.0818%	<=	0.0877%	A	31	>	2.6192%	<=	2.8033%	C
80	>	0.0877%	<=	0.0941%	A	30	>	2.8033%	<=	3.0000%	C
79	>	0.0941%	<=	0.1009%	A	29	>	3.0000%	<=	3.2407%	D
78	>	0.1009%	<=	0.1082%	A	28	>	3.2407%	<=	3.4653%	D
77	>	0.1082%	<=	0.1160%	A	27	>	3.4653%	<=	3.7048%	D
76	>	0.1160%	<=	0.1244%	A	26	>	3.7048%	<=	3.9602%	D
75	>	0.1244%	<=	0.1334%	A	25	>	3.9602%	<=	4.2324%	D
74	>	0.1334%	<=	0.1430%	A	24	>	4.2324%	<=	4.5224%	D
73	>	0.1430%	<=	0.1533%	A	23	>	4.5224%	<=	4.8313%	D
72	>	0.1533%	<=	0.1644%	A	22	>	4.8313%	<=	5.1602%	D
71	>	0.1644%	<=	0.1763%	A	21	>	5.1602%	<=	5.5101%	D
70	>	0.1763%	<=	0.1890%	B	20	>	5.5101%	<=	5.8824%	D
69	>	0.1890%	<=	0.2026%	B	19	>	5.8824%	<=	6.2780%	D
68	>	0.2026%	<=	0.2172%	B	18	>	6.2780%	<=	6.6985%	D
67	>	0.2172%	<=	0.2329%	B	17	>	6.6985%	<=	7.1449%	D
66	>	0.2329%	<=	0.2497%	B	16	>	7.1449%	<=	7.6186%	D
65	>	0.2497%	<=	0.2677%	B	15	>	7.6186%	<=	8.1210%	D
64	>	0.2677%	<=	0.2870%	B	14	>	8.1210%	<=	8.6535%	D
63	>	0.2870%	<=	0.3077%	B	13	>	8.6535%	<=	9.2173%	D
62	>	0.3077%	<=	0.3299%	B	12	>	9.2173%	<=	9.8139%	D
61	>	0.3299%	<=	0.3537%	B	11	>	9.8139%	<=	10.4448%	D
60	>	0.3537%	<=	0.3792%	B	10	>	10.4448%	<=	11.1111%	D
59	>	0.3792%	<=	0.4065%	B	9	>	11.1111%	<=	11.8144%	D
58	>	0.4065%	<=	0.4358%	B	8	>	11.8144%	<=	12.5559%	D
57	>	0.4358%	<=	0.4672%	B	7	>	12.5559%	<=	13.3369%	D
56	>	0.4672%	<=	0.5008%	B	6	>	13.3369%	<=	14.1586%	D
55	>	0.5008%	<=	0.5368%	B	5	>	14.1586%	<=	15.0221%	D
54	>	0.5368%	<=	0.5754%	B	4	>	15.0221%	<=	15.9286%	D
53	>	0.5754%	<=	0.6168%	B	3	>	15.9286%	<=	16.8788%	D
52	>	0.6168%	<=	0.6611%	B	2	>	16.8788%	<=	17.8738%	D
51	>	0.6611%	<=	0.7086%	B	1	>	17.8738%	<=	100%	D