creditsafe

# Creditsafe France

## Generic Scorecard

# Companies

Executive Summary

Group Analytics

Version Mars 2021

# 1. Executive Summary

## 1.1. Creditsafe France Generic Scorecard Overview

In order to improve and increase Creditsafe's presence in the French 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 French 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.

## 1.2. Scorecards and Segmentation

The essential concept behind Creditsafe's scoring approach is to accurately predict business behaviour (in terms of their good/bad performance over the next 12 months) using a set of characteristics that clearly identify why a business is considered to be high or low risk.

To increase the discriminative power of the scorecard solution, segmentation was conducted. The aim of the segmentation was to define a set of sub-populations that, when modelled individually and combined, rank risk more effectively than a single model on the overall population. The main base for the segmentation has been the size of the company. Except this, two scorecards where financial accounts don't exist has been developed (either the company is newly established or the financial account is too old to be taken in consideration in the score calculation). For other types of companies (without any accounts) two different scorecards, based on legal forms, has been produced where the relevant data is very limited.

**Companies that have to publish their accounts;**

1. New – companies who haven't yet filed their accounts, age up to 24 months
2. Old without any financials – Not filed their accounts the last 24 months
3. Micro companies
4. Small companies
5. Medium/Large companies

**Other types of companies (without any accounts);**

1. A : Association, Civil companies, Real Estate Civil Company, Groupment, GIE
2. B : Other Legal Forms: Soles traders, Craftsmen , liberal profession

## 1.3. Individual PD (probability of default) versus score 1-100

Creditsafe's scorecard provide a score between 1 and 100 representing the highest and lowest risk respectively. This scale was produced using the probability of default (PD) output from development and is a simple representative way for customers to accept or decline credit applications. With the launch of the new scorecard the Creditsafe score will be accompanied with a PD which is produced for each company based on their combination of characteristics. The conversion will still be created from the PD but since the PD will be kept at a company level, instead of matching the scores, there will be a range of PD per score.

## 1.4. Summary of Results

**Population matrix for companies with filed accounts**

| Score band | Min PD | Max PD | Min Score | Max Score | % of population | Bad ratio |
|---|---|---|---|---|---|---|
| A | 0,01% | 0,25% | 71 | 100 | 18% | 0,09% |
| B | 0,25% | 0,91% | 51 | 70 | 35% | 0,36% |
| C | 0,91% | 3,12% | 30 | 50 | 33% | 1,49% |
| D | 3,12% | 99,99% | 1 | 29 | 14% | 5,06% |

**Population distribution for companies with filed accounts**
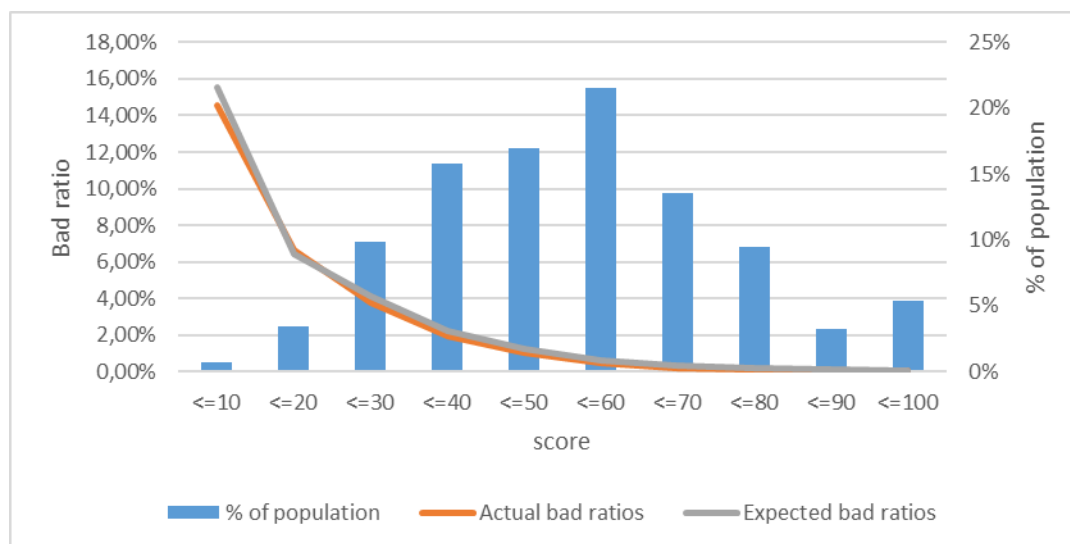
**Population matrix for other types of companies (without any accounts)**

| Score band | Min PD | Max PD | Min Score | Max Score | % of population | Bad ratio |
|---|---|---|---|---|---|---|
| A | 0,01% | 0,25% | 71 | 100 | 0,25% | 0,25% |
| B | 0,25% | 0,91% | 51 | 70 | 29,30% | 0,89% |
| C | 0,91% | 3,12% | 30 | 50 | 56,43% | 1,71% |
| D | 3,12% | 99,99% | 1 | 29 | 14,02% | 5,96% |

**Population distribution for other types of companies (without any accounts)**
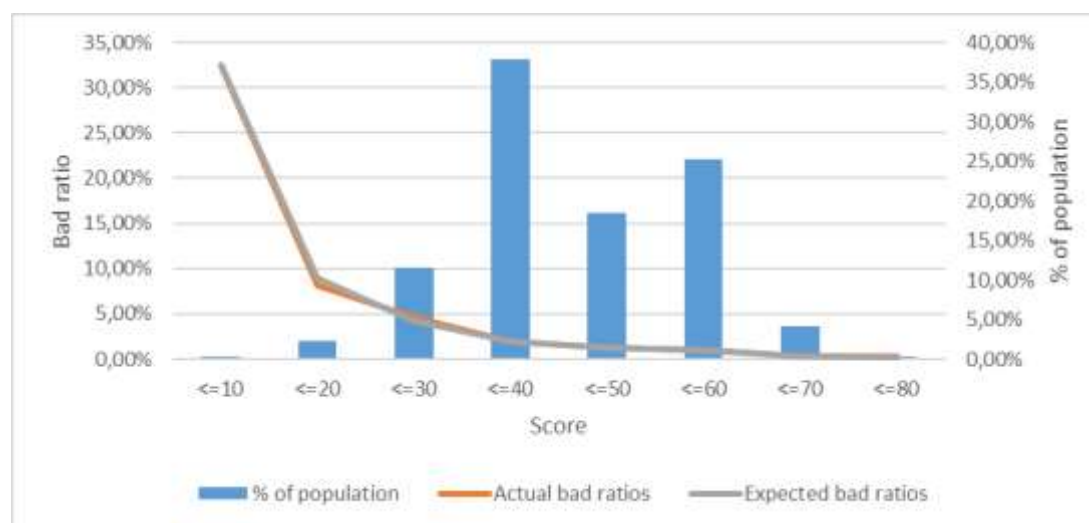


**Predictive power – Gini coefficient**

The Gini coefficients represent good discrimination across all segments of the French company population. To provide further comfort around the robustness of the scorecard, Creditsafe validated the scorecards using an out of time validation technique. The results showed that all attributes were within tolerance with and acceptable level of accuracy. Creditsafe continuously monitor and validate the scorecards to keep them robust. The Gini coefficient for the new scorecards are up to 73 % depending on what segment we study due to availability of relevant predictive data.

# 2. Data Preparation & Population Design

## 2.1. Sample Design

The scorecards were developed from a generic sample of French data extracted from the Creditsafe data pool. The selection of the sample definition satisfied the following:

- The generic sample was created to recognise economically active companies. There are sufficient businesses to develop a robust scorecard.
- Each business had a 12 months' exposure period, this is sufficient for business performance to be reliably assigned.
- The window covers a full year to avoid seasonality.
- The sample window is recent enough to be representative of the future French population.

The scorecard development sample was created taking business information from 1st June 2015 to 31th May 2017, giving 24 months of information. A 12-month outcome period was then used from 1st June 2017 to 31st May 2018 to assign the good/bad population.

## 2.2. CS France Default Definition

The performance definition defined for the French scorecard development as below. The performance definition is designed to clearly identify why a business is considered to be high or low risk.

| | |
|---|---|
| **Bad** | Closure for Insufficient Assets<br>Conversion of the Protection into Involuntary Liquidation<br>Conversion of the Protection into Receivership<br>Extension of involuntary liquidation<br>Extension of the receivership procedure<br>Personal Bankruptcy<br>Closure Judgement after transfer<br>Prohibited from managing a business<br>Involuntary Liquidation<br>Simplified Involuntary Liquidation<br>Receivership<br>Simplified Receivership |
| **Good** | None of the above status definitions |

# 3. Scorecard Development

**Modelling Methodology**

Stepwise Logistic Regression has been used to develop the scorecard. This is the preferred methodology within Creditsafe. Logistic Regression has the benefit of outputting a predicted probability of good; this enables the creation of an accurate score to bad rate prediction.

**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.

It is necessary however to perform another overall check 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.

In particular, it is necessary to check that the score points given to the characteristic attributes are assigned in a way that is consistent with the corresponding bad rate of all the characteristic attributes defined for a given characteristic. Particular attention is given to the sign of the score point i.e. minus sign appears where a plus sign is expected and vice versa.

**Scorecard Calibration**

The output from the logistic model produces individual PDs for each of the companies and each of the models, respectively. These PDs have been transformed into a 1-100 Creditsafe score using points double the odds principles. This value was chosen to allow the score and PD to match at the point required, as well as matching the score distribution expected by the French market. This score is a direct representation of the underlying PD. The following table details the relevant PD in relation to the Creditsafe 1-100 score:

| SCORE | | MIN PD | | MAX PD | BAND | SCORE | | MIN PD | | MAX PD | BAND |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 100 | > | 0,0000% | <= | 0,0461% | A | 50 | > | 0,9080% | <= | 0,9649% | C |
| 99 | > | 0,0461% | <= | 0,0488% | A | 49 | > | 0,9649% | <= | 1,0253% | C |
| 98 | > | 0,0488% | <= | 0,0517% | A | 48 | > | 1,0253% | <= | 1,0895% | C |
| 97 | > | 0,0517% | <= | 0,0548% | A | 47 | > | 1,0895% | <= | 1,1576% | C |
| 96 | > | 0,0548% | <= | 0,0580% | A | 46 | > | 1,1576% | <= | 1,2299% | C |
| 95 | > | 0,0580% | <= | 0,0615% | A | 45 | > | 1,2299% | <= | 1,3067% | C |
| 94 | > | 0,0615% | <= | 0,0651% | A | 44 | > | 1,3067% | <= | 1,3882% | C |
| 93 | > | 0,0651% | <= | 0,0690% | A | 43 | > | 1,3882% | <= | 1,4748% | C |
| 92 | > | 0,0690% | <= | 0,0731% | A | 42 | > | 1,4748% | <= | 1,5666% | C |
| 91 | > | 0,0731% | <= | 0,0774% | A | 41 | > | 1,5666% | <= | 1,6640% | C |
| 90 | > | 0,0774% | <= | 0,0821% | A | 40 | > | 1,6640% | <= | 1,7674% | C |
| 89 | > | 0,0821% | <= | 0,0869% | A | 39 | > | 1,7674% | <= | 1,8772% | C |
| 88 | > | 0,0869% | <= | 0,0921% | A | 38 | > | 1,8772% | <= | 1,9935% | C |
| 87 | > | 0,0921% | <= | 0,0976% | A | 37 | > | 1,9935% | <= | 2,1170% | C |
| 86 | > | 0,0976% | <= | 0,1034% | A | 36 | > | 2,1170% | <= | 2,2479% | C |
| 85 | > | 0,1034% | <= | 0,1095% | A | 35 | > | 2,2479% | <= | 2,3867% | C |
| 84 | > | 0,1095% | <= | 0,1160% | A | 34 | > | 2,3867% | <= | 2,5339% | C |
| 83 | > | 0,1160% | <= | 0,1229% | A | 33 | > | 2,5339% | <= | 2,6899% | C |
| 82 | > | 0,1229% | <= | 0,1302% | A | 32 | > | 2,6899% | <= | 2,8552% | C |
| 81 | > | 0,1302% | <= | 0,1379% | A | 31 | > | 2,8552% | <= | 3,0303% | C |
| 80 | > | 0,1379% | <= | 0,1461% | A | 30 | > | 3,0303% | <= | 3,1154% | C |
| 79 | > | 0,1461% | <= | 0,1548% | A | 29 | > | 3,1154% | <= | 3,3385% | D |
| 78 | > | 0,1548% | <= | 0,1640% | A | 28 | > | 3,3385% | <= | 3,5769% | D |
| 77 | > | 0,1640% | <= | 0,1737% | A | 27 | > | 3,5769% | <= | 3,8318% | D |
| 76 | > | 0,1737% | <= | 0,1840% | A | 26 | > | 3,8318% | <= | 4,1039% | D |
| 75 | > | 0,1840% | <= | 0,1949% | A | 25 | > | 4,1039% | <= | 4,3946% | D |
| 74 | > | 0,1949% | <= | 0,2065% | A | 24 | > | 4,3946% | <= | 4,7048% | D |
| 73 | > | 0,2065% | <= | 0,2188% | A | 23 | > | 4,7048% | <= | 5,0357% | D |
| 72 | > | 0,2188% | <= | 0,2317% | A | 22 | > | 5,0357% | <= | 5,3886% | D |
| 71 | > | 0,2317% | <= | 0,2455% | A | 21 | > | 5,3886% | <= | 5,7648% | D |
| 70 | > | 0,2455% | <= | 0,2600% | B | 20 | > | 5,7648% | <= | 6,1655% | D |
| 69 | > | 0,2600% | <= | 0,2755% | B | 19 | > | 6,1655% | <= | 6,5921% | D |
| 68 | > | 0,2755% | <= | 0,2918% | B | 18 | > | 6,5921% | <= | 7,0460% | D |
| 67 | > | 0,2918% | <= | 0,3091% | B | 17 | > | 7,0460% | <= | 7,5286% | D |
| 66 | > | 0,3091% | <= | 0,3274% | B | 16 | > | 7,5286% | <= | 8,0414% | D |
| 65 | > | 0,3274% | <= | 0,3468% | B | 15 | > | 8,0414% | <= | 8,5859% | D |
| 64 | > | 0,3468% | <= | 0,3673% | B | 14 | > | 8,5859% | <= | 9,1636% | D |
| 63 | > | 0,3673% | <= | 0,3891% | B | 13 | > | 9,1636% | <= | 9,7761% | D |
| 62 | > | 0,3891% | <= | 0,4121% | B | 12 | > | 9,7761% | <= | 10,4247% | D |
| 61 | > | 0,4121% | <= | 0,4365% | B | 11 | > | 10,4247% | <= | 11,1111% | D |
| 60 | > | 0,4365% | <= | 0,4624% | B | 10 | > | 11,1111% | <= | 11,8367% | D |
| 59 | > | 0,4624% | <= | 0,4897% | B | 9 | > | 11,8367% | <= | 12,6030% | D |
| 58 | > | 0,4897% | <= | 0,5187% | B | 8 | > | 12,6030% | <= | 13,4114% | D |
| 57 | > | 0,5187% | <= | 0,5494% | B | 7 | > | 13,4114% | <= | 14,2631% | D |
| 56 | > | 0,5494% | <= | 0,5819% | B | 6 | > | 14,2631% | <= | 15,1595% | D |
| 55 | > | 0,5819% | <= | 0,6163% | B | 5 | > | 15,1595% | <= | 16,1016% | D |
| 54 | > | 0,6163% | <= | 0,6527% | B | 4 | > | 16,1016% | <= | 17,0904% | D |
| 53 | > | 0,6527% | <= | 0,6912% | B | 3 | > | 17,0904% | <= | 18,1269% | D |
| 52 | > | 0,6912% | <= | 0,7320% | B | 2 | > | 18,1269% | <= | 19,2117% | D |
| 51 | > | 0,7320% | <= | 0,9080% | B | 1 | > | 19,2117% | <= | 99,9999% | D |