



creditsafe<sup>+</sup>

**Creditsafe UK**

**Generic Scorecards**

**Ltd and Non Ltd companies**

Executive Summary

Group Analytics

Version August 2019



## 1. Executive Summary

### 1.1. Creditsafe UK Generic Scorecard Overview

In order to improve and increase Creditsafe's presence in the UK 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 optimising and maximising 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 UK 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, a scorecard for newly established limited companies has been produced where the company has not yet filed any account. For non-limited a specific scorecard has also been produced where the relevant data is very limited.

#### **Limited company scorecards;**

1. New – companies who haven't yet filed their accounts, age up to 18 months
2. Micro companies
3. Small companies
4. Medium companies
5. Large companies

#### **Non limited company scorecard;**

1. Non limited companies

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

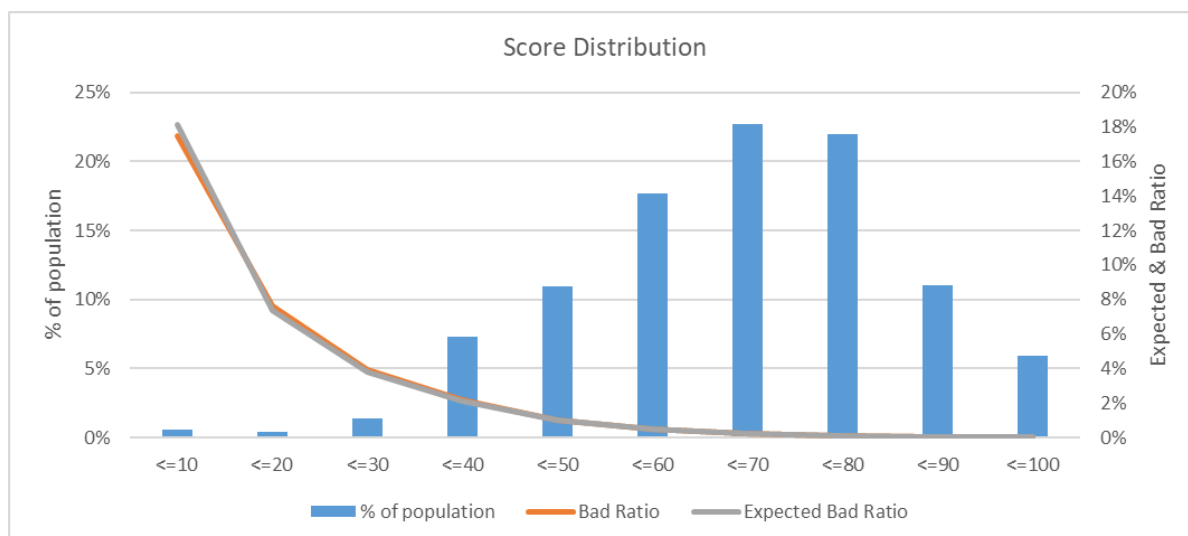
Creditsafe's scorecards provide a score between 1 and 100 representing the highest and lowest risk respectively. This scale was produced using the probability of default (PD) output from development and is a simple representative way for customers to accept or decline credit applications. With the launch 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

#### Total population matrix

Band	Min PD	Max PD	Min Score	Max Score	% of pop	Bad Ratio
A	0,01%	0,18%	71	100	36,2%	0,10%
B	0,19%	0,74%	51	70	39,5%	0,37%
C	0,75%	3,00%	30	50	20,5%	1,44%
D	3,01%	99,99%	1	29	3,8%	9,17%

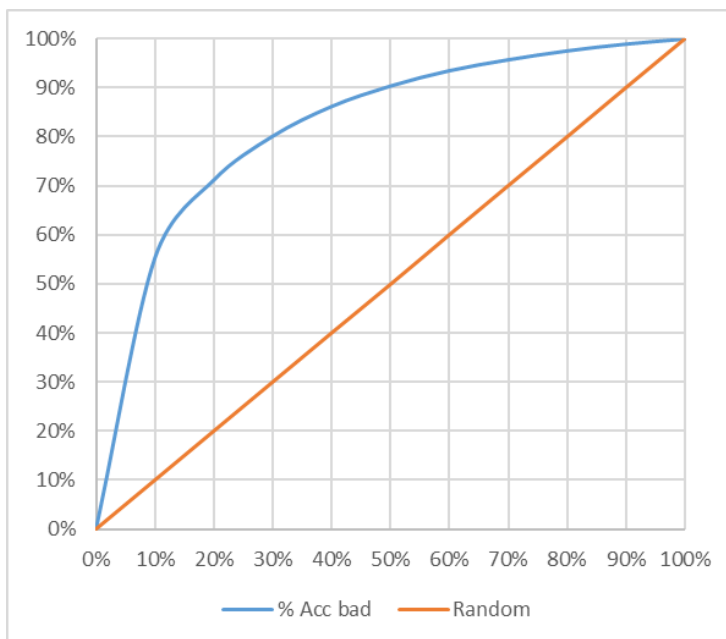
#### Total population distribution



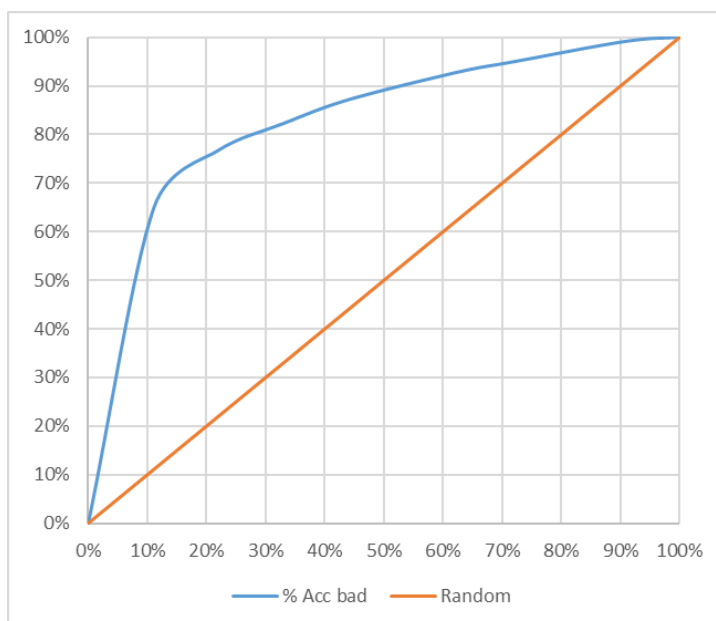
## Total Population Gini

The Gini coefficients represent excellent discrimination across all segments of the UK 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 an acceptable level of accuracy. Creditsafe continuously monitors and validates the scorecards to keep them robust.

The overall Gini score of the total UK population for Ltd companies is 68 %.



The overall Gini score of the UK population for non Ltd companies is 69 %.



## 2. Data Preparation & Population Design

### 2.1. Sample Design

The scorecards were developed from a generic sample of UK 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 UK population.

The scorecard development sample was created taking business information from 1<sup>st</sup> May 2014 to 30<sup>th</sup> April 2017, giving 36 months of information. A 12-month outcome period was then used from 1<sup>st</sup> May 2017 to 30<sup>st</sup> April 2018 to assign the good/bad population.

### 2.2. CSUK Default Definition

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

#### Ltd Companies

Defaults	Ltd companies
<b>Bad</b>	Company is liquidated or is wound-up Administration Order Administrative Receiver Appointed Receivership / Administration In Administration Forced Liquidation Meeting of Creditors Appointment of Liquidator Administrator Appointed In Examinership In Receivership / Liquidation
<b>Good</b>	None of the above status definitions

### Non Ltd Companies

Defaults	Non Ltd companies
<b>Bad</b>	<ul style="list-style-type: none"> <li>• CCJ</li> </ul>
<b>Good</b>	<ul style="list-style-type: none"> <li>• None of the above status definitions</li> </ul>

## 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 with a factor of 10 for every model. 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 UK 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	> 0.000%	<= 0.024%	A	50	> 0.719%	<= 0.770%	C
99	> 0.024%	<= 0.026%		49	> 0.770%	<= 0.825%	
98	> 0.026%	<= 0.028%		48	> 0.825%	<= 0.884%	
97	> 0.028%	<= 0.030%		47	> 0.884%	<= 0.947%	
96	> 0.030%	<= 0.032%		46	> 0.947%	<= 1.014%	
95	> 0.032%	<= 0.034%		45	> 1.014%	<= 1.086%	
94	> 0.034%	<= 0.037%		44	> 1.086%	<= 1.163%	
93	> 0.037%	<= 0.039%		43	> 1.163%	<= 1.246%	
92	> 0.039%	<= 0.042%		42	> 1.246%	<= 1.334%	
91	> 0.042%	<= 0.045%		41	> 1.334%	<= 1.428%	
90	> 0.045%	<= 0.049%		40	> 1.428%	<= 1.529%	
89	> 0.049%	<= 0.052%		39	> 1.529%	<= 1.637%	
88	> 0.052%	<= 0.056%		38	> 1.637%	<= 1.752%	
87	> 0.056%	<= 0.060%		37	> 1.752%	<= 1.876%	
86	> 0.060%	<= 0.064%		36	> 1.876%	<= 2.008%	
85	> 0.064%	<= 0.069%		35	> 2.008%	<= 2.149%	
84	> 0.069%	<= 0.073%		34	> 2.149%	<= 2.299%	
83	> 0.073%	<= 0.079%		33	> 2.299%	<= 2.460%	
82	> 0.079%	<= 0.084%		32	> 2.460%	<= 2.632%	
81	> 0.084%	<= 0.090%		31	> 2.632%	<= 2.816%	
80	> 0.090%	<= 0.097%		30	> 2.816%	<= 3.012%	
79	> 0.097%	<= 0.104%		29	> 3.012%	<= 3.221%	
78	> 0.104%	<= 0.111%		28	> 3.221%	<= 3.445%	
77	> 0.111%	<= 0.119%		27	> 3.445%	<= 3.683%	
76	> 0.119%	<= 0.128%		26	> 3.683%	<= 3.937%	
75	> 0.128%	<= 0.137%		25	> 3.937%	<= 4.207%	
74	> 0.137%	<= 0.147%		24	> 4.207%	<= 4.496%	
73	> 0.147%	<= 0.157%		23	> 4.496%	<= 4.803%	
72	> 0.157%	<= 0.169%		22	> 4.803%	<= 5.130%	
71	> 0.169%	<= 0.181%		21	> 5.130%	<= 5.478%	
70	> 0.181%	<= 0.194%		20	> 5.478%	<= 5.848%	
69	> 0.194%	<= 0.208%		19	> 5.848%	<= 6.241%	
68	> 0.208%	<= 0.222%		18	> 6.241%	<= 6.660%	
67	> 0.222%	<= 0.238%		17	> 6.660%	<= 7.104%	
66	> 0.238%	<= 0.255%		16	> 7.104%	<= 7.575%	
65	> 0.255%	<= 0.274%		15	> 7.575%	<= 8.075%	
64	> 0.274%	<= 0.293%		14	> 8.075%	<= 8.604%	
63	> 0.293%	<= 0.314%		13	> 8.604%	<= 9.165%	
62	> 0.314%	<= 0.337%		12	> 9.165%	<= 9.759%	
61	> 0.337%	<= 0.361%		11	> 9.759%	<= 10.387%	
60	> 0.361%	<= 0.387%		10	> 10.387%	<= 11.050%	
59	> 0.387%	<= 0.414%		9	> 11.050%	<= 11.750%	
58	> 0.414%	<= 0.444%		8	> 11.750%	<= 12.488%	
57	> 0.444%	<= 0.476%		7	> 12.488%	<= 13.265%	
56	> 0.476%	<= 0.510%		6	> 13.265%	<= 14.083%	
55	> 0.510%	<= 0.546%		5	> 14.083%	<= 14.943%	
54	> 0.546%	<= 0.585%		4	> 14.943%	<= 15.845%	
53	> 0.585%	<= 0.627%		3	> 15.845%	<= 16.792%	
52	> 0.627%	<= 0.671%		2	> 16.792%	<= 17.782%	
51	> 0.671%	<= 0.719%	1	> 17.782%	<= 99.999%		
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