

Understanding the New Zealand D&B Delinquency Score

THIS DOCUMENT IS INTENDED TO ADDRESS THE FOLLOWING QUESTIONS:

- What is the D&B Delinquency Score?
- What does the D&B Delinquency Score predict?
- What is the availability of the D&B Delinquency Score?
- How is the D&B Delinquency Score calculated?
- How does the D&B Delinquency Score perform?
- What is the Relationship between the D&B Delinquency Score and Delinquency Rates?



INTRODUCTION

The New Zealand D&B Delinquency Score, also known in some markets as the D&B Commercial Credit Score (CCS), predicts the likelihood that a business will become severely delinquent in its payments over the next 12 month period.

To evaluate risks objectively and consistently, Dun & Bradstreet combines a large amount of business information with expert analysis and statistical techniques to determine the risk associated with a business.

The integrity of the information contained in our Data Cloud is driven by our proprietary DUNSRight™ Quality Process.

DUNSRight™ is our process for collecting and enhancing information.

The New Zealand D&B Delinquency Score is highly effective in helping to predict the potential solvency of your existing and prospective customers. The solution allows you to:

- Automate decisions for increased efficiency
- Process large volumes of transactions more quickly
- Free up resources to look at time-intensive borderline decisions
- Enable more consistent decisions across the entire organization
- Reduce the costs associated with full-scale application and annual risk reviews
- Apply scores across an entire portfolio to quickly identify risk and opportunity
- Manage collection resources with prioritized actions for delinquent accounts
- Satisfy regulatory needs for timely, consistent and objective review of decisions at the account level

This document explains in greater detail how the New Zealand Delinquency Scoring System was developed.

NEW ZEALAND D&B DELINQUENCY SCORE

WHAT THE D&B DELINQUENCY SCORE PREDICTS

The D&B Delinquency Score predicts the likelihood that a business will become severely delinquent in its payments over the next 12 month period. Dun & Bradstreet defines a severely delinquent company as one that fails to repay its financial obligation within 90 days past terms over the next 12 months, based on the information in the Dun & Bradstreet Data Cloud.

AVAILABILITY OF THE DELINQUENCY SCORE

The D&B Delinquency Score is available on approximately 600,000 businesses. This is known as the Scoreable Universe.

The following are not considered for scoring and are outside of the Scoreable Universe:

- Businesses which are Out of Business
- Inoperative Entities
- Entities in non-scoreable industries

The D&B Delinquency Score will not be calculated for branches. Automatic trade-up to the headquarter location score will take place for branch locations.

SCORE DEVELOPMENT PROCESS

The Delinquency Scorecards were developed using rigorous statistical techniques for all stages of the modeling process. This ensures that the resulting model is stable and robust. Our process of checks and balances also includes validation of the models on separate samples from different time periods to ensure stability over time. As a result our Standard Scores are suitable for use in regulatory environments such as Basel and Solvency.

In the scorecard development process, data is extracted from two time periods designated as an observation point and a performance window. The observation point defines the sample used in the model and all identification and characteristic data are collected from the time period directly prior to that point. The predictive variables and segmentation are defined from this snapshot. The performance window defines the length of time the businesses in the sample are tracked to examine their behavior.

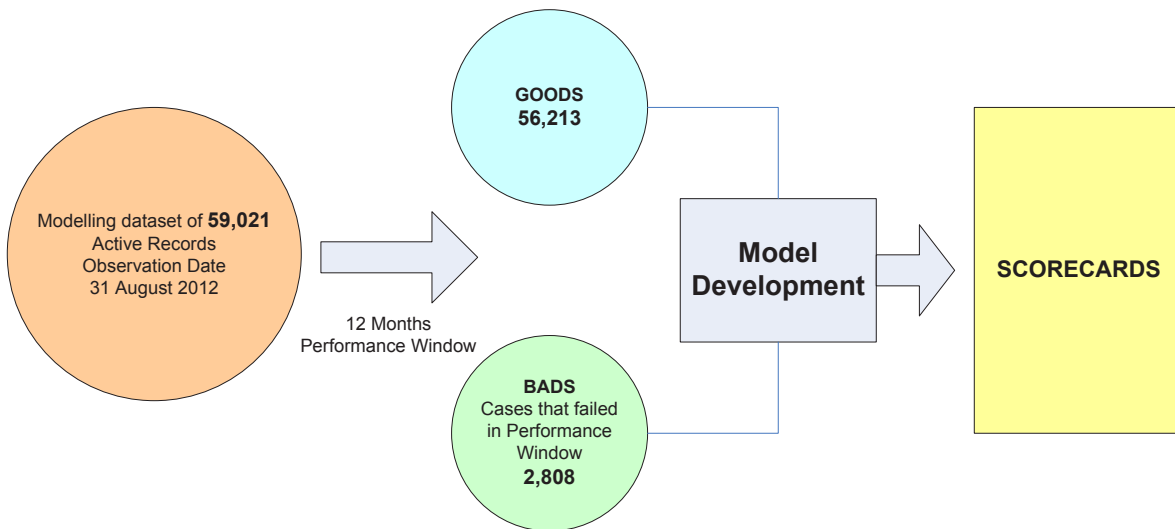
In the development of the New Zealand D&B Delinquency Score, the observation point was 1st September 2012 and the performance window was the twelve months from 1st September 2012 to 31st August 2013. A total of 59,021 businesses were used in model development. Of this population, 56,213 were considered “good”, or non-severely delinquent companies in the Dun & Bradstreet Data Cloud and 2,808 were considered “bad”, or severely delinquent companies in the Dun & Bradstreet Data Cloud.

Sample data elements used in the model include:

- Demographic information such as industry size, corporate structure
- Financial information
- Dun & Bradstreet proprietary trade payment behavior information
- Legal events such as collections, liens and judgments

Appendix A contains a more comprehensive list of data elements which are used in calculating the score.

The following diagram shows the scorecard development steps



Dun & Bradstreet's statistical model development process includes the following steps:

- Segmentation analysis for optimal representation of risk behavior of various sub-populations of the scoreable universe
- Selection of optimal attributes (predictors) for each segment The attributes selected by the statistical tool are also verified by the business experts to ensure suitability in the local market conditions
- Optimal binning techniques to leverage data patterns observed in partition of the predictors
- Scoring algorithm calculation selected by the modeling technique used

To ensure the model's robustness and stability of predictors, a test and validation approach for model estimation is used.

To ensure stability of the model over time, an additional validation is performed on samples from new time windows as well as on selected large customer portfolios.

The scoring algorithm formula calculates the probability of business delinquency. This predicted probability is then converted to a score using a scorecard which assigns points to each selected level of each predictor.

SCORING OUTPUTS – SCOREVALUES

The Delinquency Score assigns the following measurements of risk:

1. A “Score” of 101 – 799 is the initial output (sum of assigned points) where 101 represents businesses that have the highest probability of Delinquency, and 799 which represents businesses with the lowest probability of Delinquency. This Score provides a direct relationship between the score and the level of risk. The marginal odds of being good doubles for each 40 point increase. For example, a business that scores a 240, on a marginal basis, is half as risky as a business that scores a 200. This score enables a customer to utilize more granular cut offs to drive their automated decision-making process.
2. A **Percentile Ranking**, where 1 represents businesses that have the highest probability of delinquency and 100 which represents businesses with the lowest probability of delinquency. This Ranking shows you where a business falls among businesses in the Dun & Bradstreet Data Cloud, and is most effectively used by customers to rank order their portfolios from highest to lowest risk of delinquency.

SCORECARD PERFORMANCE

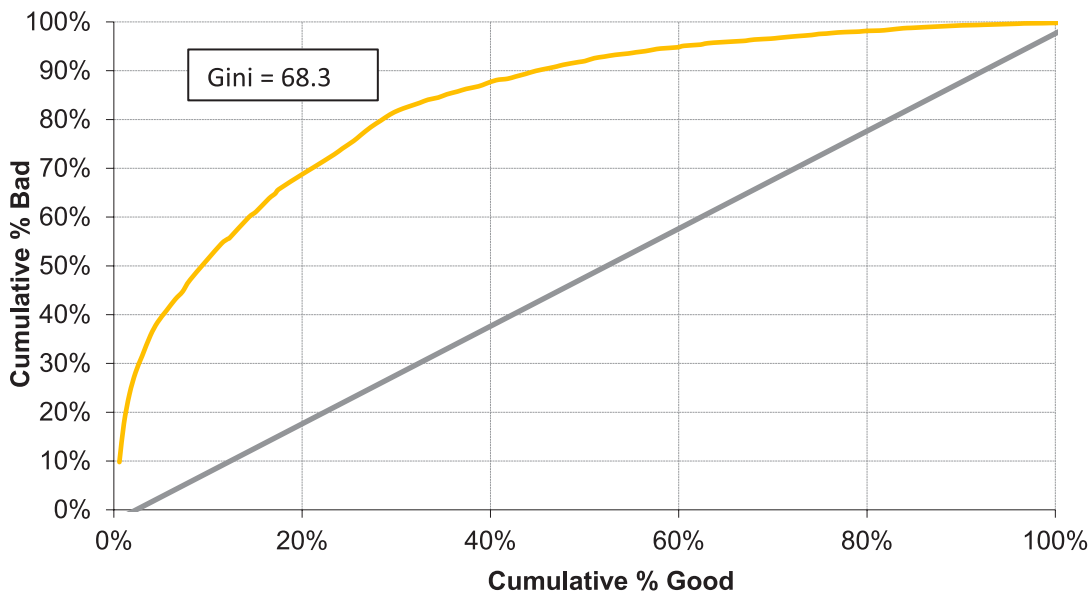
Dun & Bradstreet applies stringent rules to model performance to ensure that our scores meet the best in class performance standards. Measurements of model performance include an assessment of risk ranking, robustness and discriminate power. Metrics used are:

- Ranking accuracy by model, decile or quintile
- Close match between predicted and actual bad rates
- The Kolmogorov-Smirnoff (K-S) statistic distance between cumulated distribution of good and bad cases as rank ordered by the model
- Predictive Index (Gini Index) assessment of model gains compared to a perforce classifier
- The lift Gain chart with emphasis on showing the improvement in capturing Bads at the 10th and 20th scores

One of the typical ways to measure model effectiveness is by examining a trade-off curve. A trade-off curve is a plot of ascending accumulation of “good” businesses vs. “bad” businesses. It is useful for illustrating model performance both at a particular score and across the spectrum of score distribution.

The trade-off curve in Graph 1 illustrates the effectiveness of the Delinquency Score by identifying the delinquency captured within population groups. For example, at approximately 20% of the population, the Delinquency Score scores identified approximately 70% of the “bads”. This means that if a business focused on the worst scoring 20% of their portfolio using the Delinquency Score, they would capture 70% of the “bads” in that group.

Graph 1: Delinquency Score Performance across All Size Segments



Scorecards are developed assuming that the relationships observed between past business characteristics and subsequent performance will hold true on future businesses. Because of this assumption development statistics should be viewed as estimates, and not precise forecasts, of future performance at a given score.

SCORE PERFORMANCE MONITORING

Dun & Bradstreet is committed to delivering the highest quality scores to our Customers. Regular performance monitoring of the scorecards assures continual performance of the scores in identifying risk. Scores that lose their predictive power are scheduled for redevelopment or recalibration.

RELATIONSHIP BETWEEN THE D&B DELINQUENCY SCORE AND PROJECTED DELINQUENCY RATES

The national average delinquency rate, from September 2012 to September 2013 within the Dun & Bradstreet Data Cloud, is 4.76%.

Table 3 provides the national average Delinquency rates, based on information in the Dun & Bradstreet Data Cloud, by major industry group.

Table 3: National Average Delinquency Rate by Industry

MAJOR INDUSTRY GROUP	PROJECTED DELINQUENCY RATE
Agriculture, Forestry, Fishing	2.0%
Construction	5.7%
Manufacturing	5.4%
Transportation, Communications	4.2%
Wholesale Trade	3.9%
Retail Trade	4.5%
Finance, Insurance, Real Estate	4.7%
Services	3.8%

APPENDIX A

LIST OF DATA ELEMENTS USED IN THE DELINQUENCY SCORING MODEL

Following is a list of some of the data elements used in the Delinquency Scoring Model:

Demographic/Public Records Information

FACTOR
Number of Employees
Geographic Location
Entity Age

Director Information

FACTOR
Number of Directors
Tenure of Directors

Payment Information

FACTOR
Number of Satisfactory Payment Experiences
Maximum Percentage of Overdue Payments
Average Percentage of Overdue Payments

APPENDIX B

DETAILED PROJECTED PERFORMANCE TABLES

The following Projected Performance Table is based on the Country database. Actual performance for a customer portfolio may vary based on the account selection within that portfolio.

CUMULATIVE DELINQUENCY SCORE PERFORMANCE					
SCORE RANGE	PERCENTILE RANGE	APPROVAL RATE	BAD RATE	% OF BADS ELIMINATED	GOOD-BAD RATIO
667 - 799	96 - 100	5%	0.26%	99.71%	391
657 - 799	91 - 100	10%	0.29%	99.39%	345
649 - 799	86 - 100	15%	0.33%	98.93%	305
636 - 799	81 - 100	20%	0.40%	98.22%	246
623 - 799	76 - 100	25%	0.44%	97.61%	226
610 - 799	71 - 100	30%	0.52%	96.69%	193
604 - 799	66 - 100	35%	0.54%	95.87%	183
593 - 799	61 - 100	40%	0.60%	94.73%	165
583 - 799	56 - 100	45%	0.68%	93.44%	147
573 - 799	51 - 100	50%	0.76%	92.02%	130
561 - 799	46 - 100	55%	0.89%	89.67%	111
547 - 799	41 - 100	60%	1.02%	87.17%	97
530 - 799	36-100	65%	1.14%	84.46%	87
513 - 799	31 - 100	70%	1.34%	80.26%	74
499 - 799	26 - 100	75%	1.68%	73.52%	58
489 - 799	21 - 100	80%	2.01%	65.65%	49
480 - 799	16 - 100	85%	2.40%	56.63%	41
474 - 799	11 - 100	90%	2.72%	48.33%	36
433 - 799	6 - 100	95%	3.15%	37.13%	31
101 - 799	1 - 100	100%	4.75%	0.00%	20

DELINQUENCY SCORE PERFORMANCE WITHIN RANGE

SCORE RANGE	PERCENTILE RANGE	BAD RATE	% OF BAD IDENTIFIED
667 - 709	96 - 100	0.30%	0.30%
657 - 666	91 - 95	0.30%	0.30%
649 - 656	86 - 90	0.40%	0.50%
636 - 648	81 - 85	0.60%	0.70%
623 - 635	76 - 80	0.60%	0.60%
610 - 622	71 - 75	0.90%	0.90%
604 - 609	66 - 70	0.70%	0.80%
593 - 603	61 - 65	1.00%	1.10%
583 - 592	56 - 60	1.30%	1.30%
573 - 582	51 - 55	1.80%	1.40%
561 - 572	46 - 50	2.10%	2.40%
547 - 560	41 - 45	2.50%	2.50%
530 - 546	36 - 40	2.50%	2.70%
513 - 529	31 - 35	4.10%	4.20%
499 - 512	26 - 30	6.50%	6.70%
489 - 498	21 - 25	6.00%	7.90%
480 - 488	16 - 20	8.60%	9.00%
474 - 479	11 - 15	9.30%	8.30%
433 - 473	6 - 10	11.90%	11.20%
101 - 432	1 - 5	34.10%	37.10%

EXPLANATIONS

CUMULATIVE DELINQUENCY SCORE PERFORMANCE

- **Approval Rate:** To use, select the appropriate projected score or score cutoff that yields the desired approval rate. Approved businesses are companies scoring between the lowest value in the score range (or percentile) and 799 (or 100 percentile). For example, a credit policy that approves 70% of all businesses requires accepting businesses between 513 and 799 (31 - 100 percentile). Businesses scoring below the cutoff (101 - 512) are reviewed, declined , etc.
- **Bad Rate:** Represents those businesses that score between the lowest value in the score range and 799 For example, the Delinquency rate for a credit policy which approves all businesses with a score at or above 513 (31-100 percentile) is expected to be 1.34%.
- **% of Bads Eliminated:** The percentage of total BAD businesses that score between 101 and the cutoff point for the approval rate. For example, approving businesses with a score at or above 513 (31-100 percentile) is expected to eliminate 80.26% of the “bad”businesses.
- **Good-Bad Ratio (Odds):** The ratio of “Good” businesses to “Bad” businesses among those businesses that score between the lowest value in the score range and 799 (100 percentile). For example, a credit policy which approves all businesses scoring at or above 513 (31 - 100 percentile) should result in a portfolio with 74 “Good”businesses for every “Bad”business in the portfolio.

DELINQUENCY SCORE PERFORMANCE WITHIN RANGE

- **Bad Rate:** The incidence of Delinquency for those businesses that score within the score range. For example, the Delinquency rate for companies scoring between 499 and 512 (26 - 30 percentile) is expected to be 6.50%.
- **% of Bads Identified:** The percentage of delinquent businesses within the score range. For example, 6.70%of all delinquent companies are expected to score between 499 and 512 (26 - 30 percentile).

APPENDIX C

GLOSSARY OF SCORING TERMS

TERM	EXPLANATION
D&B Failure	D&B Standard Risk Score predicting likelihood of a business failing and/or financial distress, also known as the D&B Financial Stress Score
D&B Delinquency Score	D&B Standard Risk Score predicting likelihood of late payment behavior, also known as the D&B Commercial Credit Score
Raw Score	Score with a direct relationship to Probability of Default. The Delinquency form of the raw score is a 3 digit score
1 - 100 Score	Lesser granularity of the Delinquency Score: Value between 1 and 100 where 1 is the highest probability of default
Percentile Ranking	A ranking of the Data Cloud where 1 is assigned to the highest risk 1% of a scoring universe and 2 is assigned to the next highest risk 1% of a scoring universe. 100 is assigned to the lowest risk 1% of a scoring universe.
Scorable Universe	All records in the Data Cloud which meet criteria for score assignment. Examples of records excluded from the Scorable Universe include Out of Business records, Foreign Companies etc.
Scored Universe	All cases which are presented for a scoring assessment
Observation Point	Date, at which the data sample of active businesses is extracted and data elements observed at that point evaluated as potential predictors
Performance Window	Period where the data sample is monitored to classify businesses as GOOD and BAD
BAD	A business which meets the Bad definition
GOOD	A Business which does not have any information listed within the BAD definition
Out of Business	Business is no longer trading



ABOUT DUN & BRADSTREET

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