

CD NTC Scorecard Implementation Document

Key Points:

1. The scorecard has to be deployed at QDE stage.
2. All of the Hard Decline rules at BRE stage 1 such as age norms, negative area have to be executed first before scorecard stage

Variables:

- Residence Zip code Group
- PAN series Group
- Dealer Group
- DSA Group
- Personal Mobile Number series Group

Exclusions

Customers who have furnished below information cannot be scored

1. Age>68 and Age<18
2. Applied amount=0
3. Applied amount<7000
4. PersonalMobileNumber=0
5. Total digits in PersonalMobileNumber!=10
6. ResZip=0 or ResZip=NULL
7. Mobile Number starting from 1 to 5
8. dealerId=0 or dealerId=NULL
9. Dsald =0 or Dsald=NULL

Input data mapping

ResidenceZipCode Group

- Pincode grouping is a MultiIndex Grouping. The indices are pincode,city and state
- Same pincode is mapped to two different cities. Hence multilevel grouping is chosen. Pincode,City and State form a unique combination.
- Refer the sheet pincode_mapping in the file CD NTC implementation.xlsx for the grouping. Pincode,City and State combination of an applicant has to be matched with that of in the sheet to map WOE. In case a match is not found, impute it with corresponding City WOE(city and state combination). In case, city match is not found impute it with State WOE. Refer the sheets city_group and state_group in the file CD NTC implementation for the same.

DSA Group

- Refer the sheet dsa_group in the file CD NTC implementation.xlsx to map the dsald to its corresponding WOE. In case a match is not found, impute WOE with the WOE of the group DSAGrpLt25

Personal Mobile Number series Group

- Subset the first four digits of the mobile number.
- Refer the sheet mobile_group in the file CD NTC implementation.xlsx to map the first four digits of mobile number to corresponding WOE. In case a match is not found, check whether alternate mobile number is present and use this to match. If still a match is not found then fill WOE with zero to indicate an Odd of 1

DealerGroup

- Refer the sheet dealer_group in the file CD NTC implementation.xlsx to map the dealerId to its corresponding WOE. In case a match is not found, impute WOE with the WOE of the group DealerGrpLt10

PAN series Group

- Extract the first letter of the PAN Number
- If PAN Number is missing, fill it with the text 'MISSING or INVALID PAN'
- Check whether the PAN number is in valid format. If not then, fill it with the text 'MISSING or INVALID PAN'

After these operations the field can contain any one of the following two values:

1. First letter of PAN Number
2. MISSING or INVALID PAN

Refer the sheet PAN_group in the file CD NTC implementation.xlsx to map the WOE. If the match is not found, map the woe of the group 'H and above'

Scoring:

Use the following equation to get y

$$y = -0.00318597 - (0.57996401 * \text{mobile_woe}) - (0.82695744 * \text{pan_series_woe}) - (0.55416434 * \text{dealer_woe}) - (0.45330789 * \text{dsa_woe}) - (0.46497264 * \text{Pincode_woe})$$

Then calculate Probability of FPD as below

$$\frac{1}{1 + \exp^{-y}} = P(\text{FPD})$$

FPD = First Payment Default as on the end of first month on book

Finally, compute the log-odds and the score

$$\log(\text{odds}) = \ln \left(\frac{P(\text{FPD})}{1 - P(\text{FPD})} \right)$$

$$\text{Score} = 375.62 - 28.97 * \log(\text{odds})$$

Scorecard Validation:

We propose the scorecard to be validated twice in the first quarter following the implementation and once a quarter thereafter using Population Stability Index