

# Models

Frameworks for comprehensive risk  
assessment of borrowers



# Models

## Our Value Proposition



Developed models across the retail and non-retail spectrum leveraging

- >> CRISIL's experience in rating 100,000+ entities; largest research set up in India
- >> BIRS experience of validating models for 14+ banks/ FIs in India



Expertise in model development & validation; serviced 65+ banks/FIs globally

**9 out of top 10 banks** in India and 30+ BFSI entities across the globe use our models to assess their portfolio



Ability to develop nuanced models based on client profile.

For e.g. in SME: multiple model variants viz. Self-employed non-professionals across Manufacturing, Services, Traders, Self-employed professions etc



BIRS brings knowledge of various industry dynamics in building its scorecards

# Models to evolve from heuristic to empirical models

reflecting portfolio characteristics, with periodic validation



## Expert Judgement / Heuristic Model

Depending on quality of data, initial model may have a substantial expert judgement overlay. For instance, use of proxies to identify goods / bads



## Periodic Validation & Fine-tuning

Validation using actual data collated over a period to be used for analysis

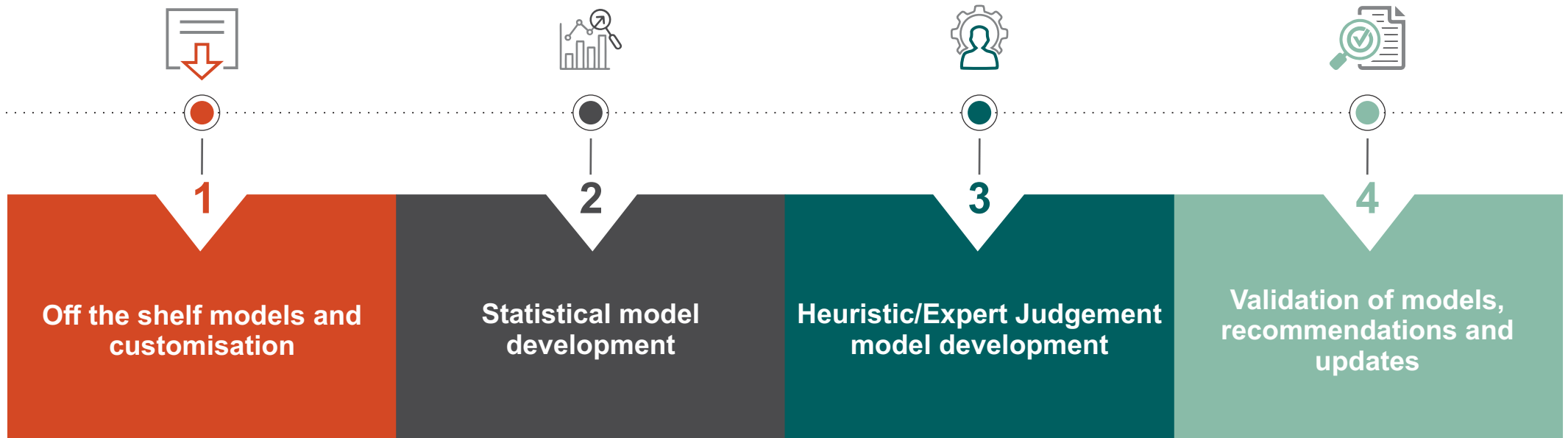


## Validated Model

Over time data-backed behavioural model, with a higher discriminating power

# BIRS Offerings

BIRS is market leader in offering credit frameworks and related services



Deploy off-the-shelf internal credit rating models along-with customization to assess a borrower's credit risk and arrive at a rating grade with corresponding probability of default

Develop models statistically which typically uses Bank's data and apply statistical tests to choose relevant variables to include in the model

Develop expert judgement models which is used usually in absence of or limitation of data







Validation of models – The accuracy of models is enhanced through various quantitative or qualitative validation processes

# Off-the-shelf models









- » More than 40 ready-to-use models for assessment of your corporate and retail portfolios
- » Updated models to reflect changing credit risk scenarios
- » Developed by credit risk professionals with experience in rating and validation exercises
- » Customized to bank's portfolio, data availability etc. through a consultative process
- » Sample of the models available off-the-shelf:

## Non-Retail Model

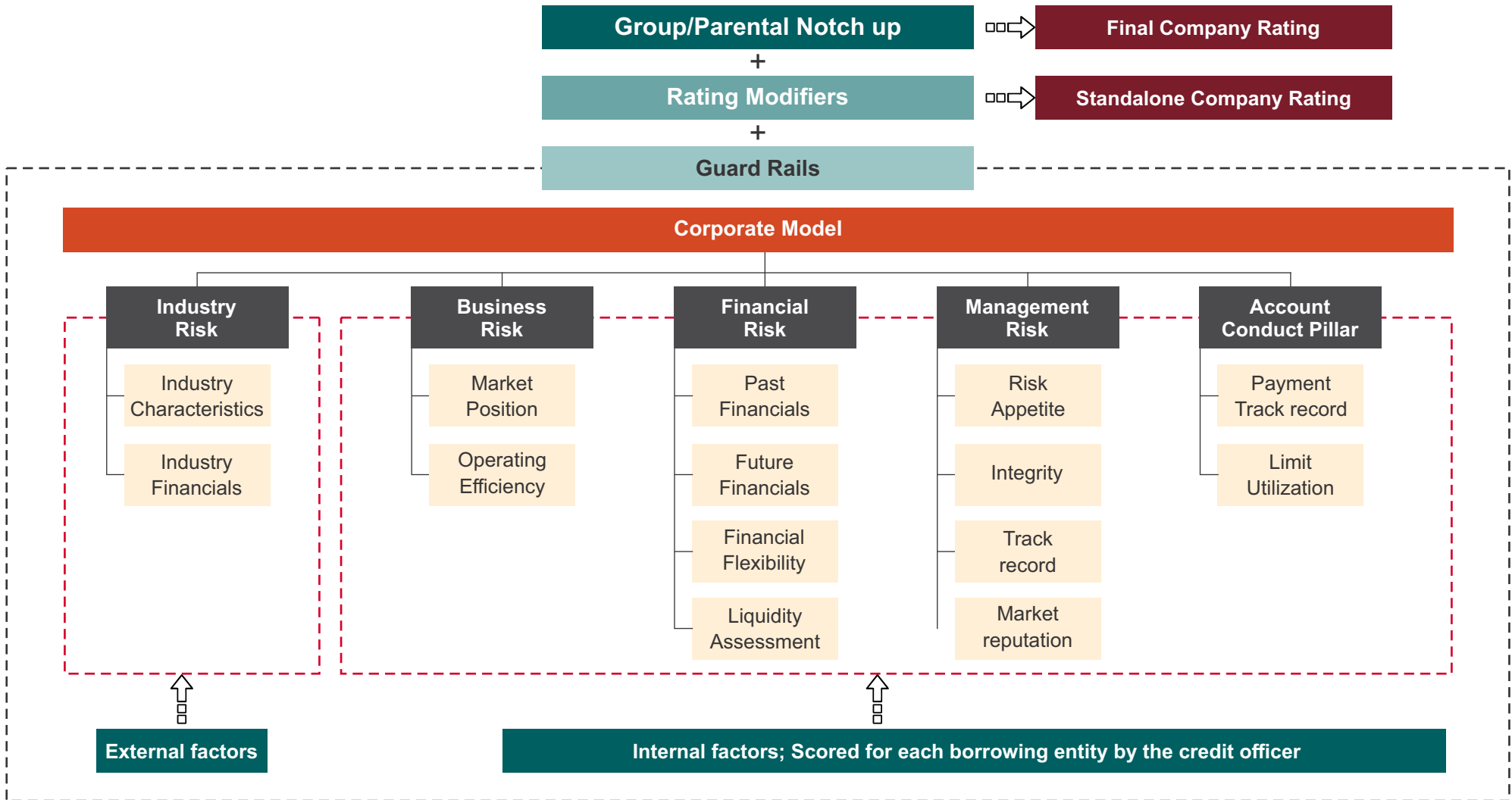
-  Corporate models
-  FI models
-  Infra Models
-  Real Estate Models
-  Lease rental discounting Model
-  MSME Models

## Retail Model

-  Personal loans
-  Home Loans
-  Vehicle loans
-  Mortgage loans
-  Education loans
-  Digital loans



# Sample Model Architecture



# Statistical Model Development Approach



**Data and Segment Definition**

Define data requirements  
Analyze available data and evaluate additional data sources  
Identification of Obligor segments  
Segregation of Good & Bad Accounts

**Variable Selection**

Judgmental Selection  
Surrogate variable selection (data unavailability)  
Statistical Tests based Selection  
Variable Reduction

**Model Development**

Model Devt - Logistic Regression  
Scorecard Scaling

**Model Validation**

Divergence Statistic  
Model performance and accuracy statistics

**Expert judgement overlay**

Industry best practices  
Specific underwriting nuances  
Risk appetite and policies

**Model Delivery**

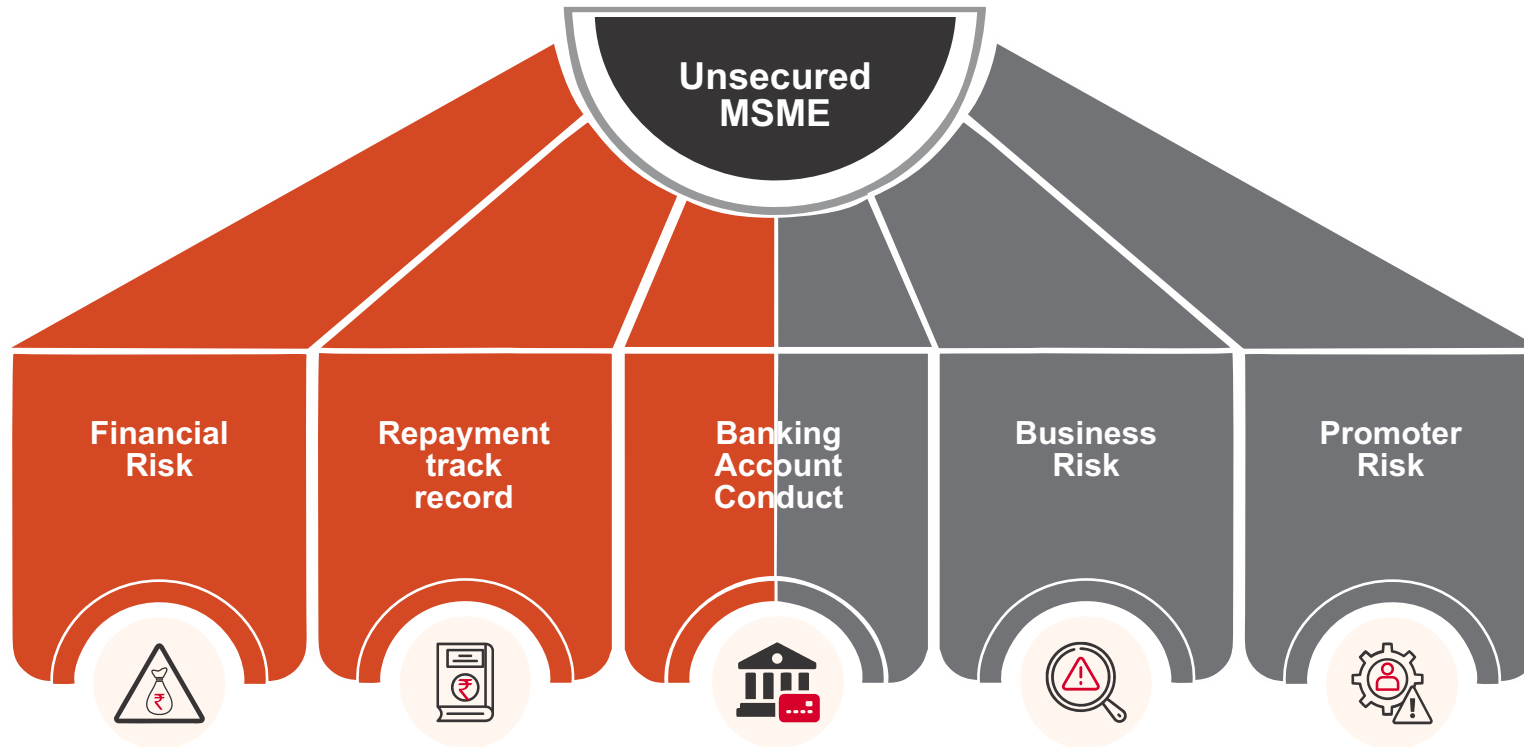
Model Documentation



Branch visits to augment credit assessment variables

# Expert judgement overlay on statistical model

Illustrative unsecured MSME model has been considered



- >> Data available and captured in mineable form
- >> All variables statistically developed and validated

- >> Datasets generally not available; heuristic development
- >> Capturing nuances of credit assessment done through personal discussion and site visits by credit analysts
- >> Model calibration to reflect bank/FIs risk appetite

 Statistically developed model

 Expert judgment overlay

- >> Expert judgment overlay
  - > As part of the overlay BIRS will tweak the architecture, weights and scores of the statistical scorecard
  - > Addition of risk pillars and variables based on industry best practices and assessment expertise

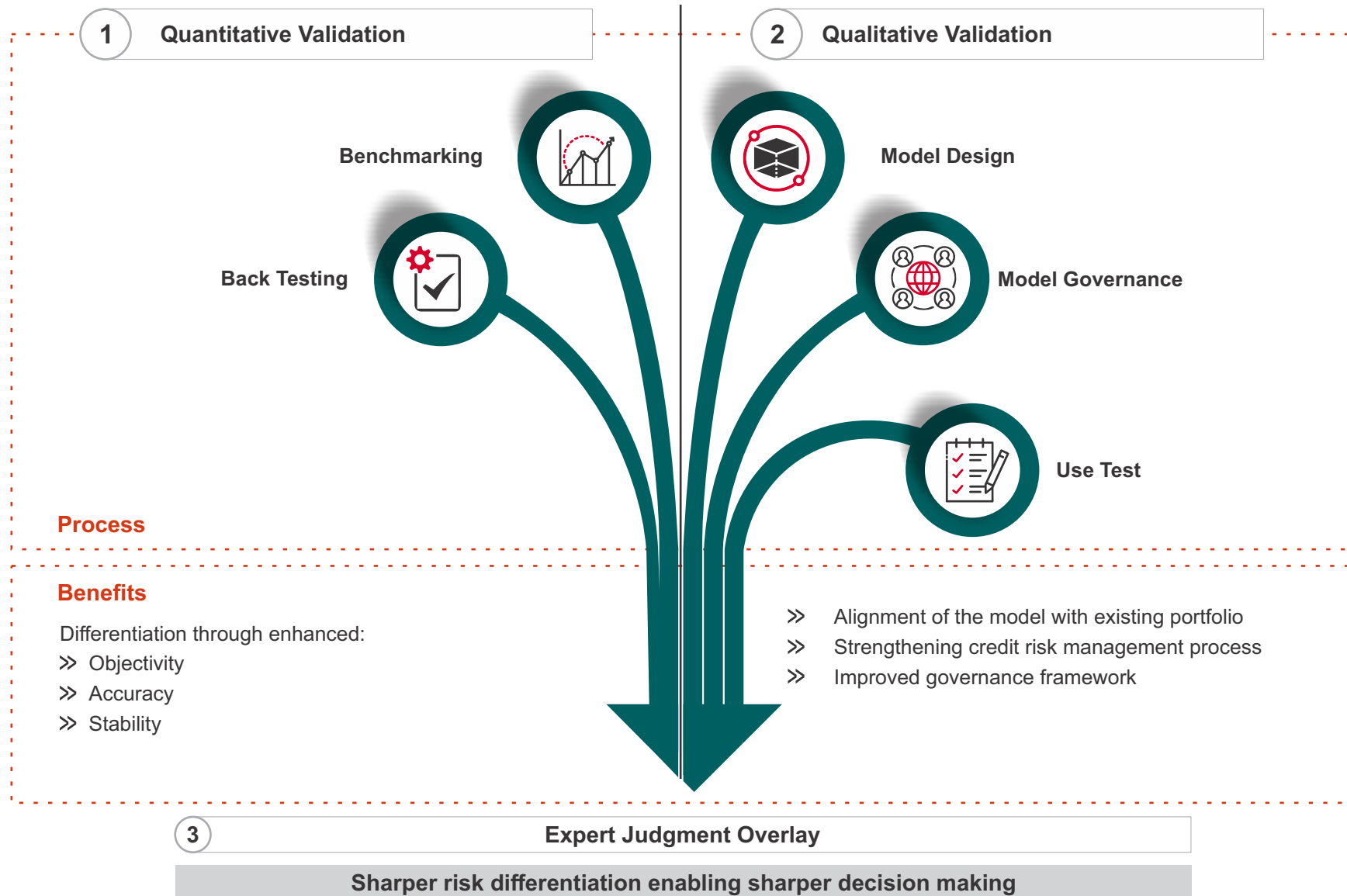


# Model validation

Approach and Methodology



Enhance accuracy and credibility of the model / scorecard through periodic validation



# | Our Clients

Business Intelligence and Risk Solutions (BIRS) provides a comprehensive range of risk management tools, analytical solutions and consulting services to financial institutions, banks, and corporates globally. We operate with a resource pool of 180+ analysts/developers and have engagements spanning 100+ clients in diverse geographies with a large presence in India, Sri Lanka, Mauritius, Malaysia, UAE and Africa. Some of our key clients include:

- India's top 2 public sector banks by assets
- India's top 3 private sector banks by assets
- Mauritius' banking regulator
- UAE's largest bank
- A large private financial services provider in Mauritius.
- A premier private sector commercial bank in Sri Lanka
- A Mid-sized Malaysian Bank
- A leading African alternate credit financier



## About CRISIL

CRISIL is a leading, agile and innovative global analytics company driven by its mission of making markets function better.

It is India's foremost provider of ratings, data, research, analytics and solutions with a strong track record of growth, culture of innovation, and global footprint.

It has delivered independent opinions, actionable insights, and efficient solutions to over 100,000 customers through businesses that operate from India, the US, the UK, Argentina, Poland, China, Hong Kong and Singapore.

It is majority owned by S&P Global Inc, a leading provider of transparent and independent ratings, benchmarks, analytics and data to the capital and commodity markets worldwide.

## About CRISIL Business Intelligence & Risk Solutions (BIRS)

CRISIL Business Intelligence & Risk Solutions (BIRS) is uniquely positioned to help banks and financial institutions in their data and analytics needs. Our deep domain knowledge of processes and best practices across the entire BFSI spectrum enables us to offer innovative solutions that aid decision making across Corporate & Investment Banking, Commercial & Retail Banking, Cards, Asset Management and Insurance domains. Our proprietary technology platform combined with deep business domain knowledge helps us deliver best in class solutions across all the key functional areas including Risk Management, Sales & Marketing, Financial Control & Reporting, Regulatory Compliance and Governance. The solutions are designed to provide advanced insights into data with an emphasis on actionable intelligence, ensuring you take data driven decisions to achieve your business objectives. To know more about what we do please visit us at [www.crisil.com](http://www.crisil.com)

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