

Quantitative Services



Leveraging deep re proprietar

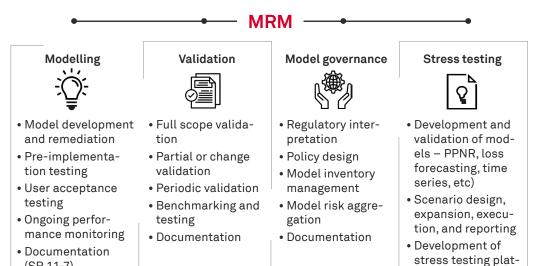
للللله 📰	
	لللللم 🚞

to deliver high quality

quantitative model risk assignments

at significantly turnaround time and cost

CRISIL model risk: Model development, validation, benchmarking, and monitoring capabilities



Data lineage, quality, and governance practices

forms



(SR 11-7)

Experience and scale of capabilities



Experience across models

Model type	Modelling details	
Credit risk/decision scorecards/IFRS9/ CECL	 PD, LGD and EAD models (retail, wholesale portfolios, including LDPs) Charge-off rate and prepayment models Obligor and facility risk rating models Credit conversion factor (CCF) models Sovereign/country risk rating models 	 IFRS 9/CECL models Model-related margin of conservatism Machine learning models Scorecards models (application, behavioural, collection, early warning, hybrid, fraud)
Market/traded risk and CCR	 VaR, CoVaR, and SVaR models Economic capital and expected shortfall models RNIV, IRC, and DRC models 	 Collateral haircut models Counterparty credit risk models (IMM and SA-CCR) SIMM, initial margin, and guarantee fund sizing models
Pricing and valuation across asset classes	 Derivatives pricing models for vanilla and exotics Curve construction and term structure-based models Volatility surface and calibration models Basis calculation and arbitrage modelling XVA (CVA, DVA, FVA) models 	 Trade reserves and funding models Regulatory charge calculation models Securitised products models – i.e. CLO, CDO, ABS, MBS, non-agency RMBS
Stress testing (DFAST/CCAR, EBA, FINMA)	 Scenario expansion and generation models PPNR models Loss projection models Global market shock models 	 Scenario computation models (GMS, LPA, FDSF, internal scenarios) Liquidity and gap risk models Scenario path generation Dynamic hedging models
Treasury/liquidity risk	 Liquidity stress-testing models Recovery and resolution planning (RRP) models QRM - NII and EVE models ALM - Behavioural models Secured/unsecured funding models 	 PPNR net interest income forecasting AFS bond and other comprehensive income forecasting models ILAAP submission
Financial crime	 AML transaction monitoring (high risk geography, hidden relationships, behavioural anomalies, cash transactions, rapid movement, cash structuring, AML money movement) Trade surveillance (market abuse, insider trading/ phishing, trade allocations, wash trades, settlement reporting) 	 Sanctions rule verification Threshold tuning using ATL/BTL Customer segmentation Fraud models (money movement, wire/payment fraud, dormant accounts, ID/card frauds)
Other models	 Asset and wealth management models (yield book, Morningstar, Barra, Barclays Point, Bloomberg mod- els, IDC BondEdge, ITG Pre-trade, ValueSearch) Operational risk VaR models Algorithmic trading models across asset classes 	 Business risk models Pillar II economic risk capital models Marketing analytics Portfolio management

Contact us

Anshuman Prasad Global Head of Risk Analytics anshuman.prasad@crisil.com Jose Ordonez Market Head, APAC jose.ordonez@crisil.com



About CRISIL Global Research & Risk Solutions (GR&RS)

CRISIL GR&RS is a leading provider of high-end research, risk and analytics services. We are the world's largest provider of equity and fixed-income research support to banks and buyside firms. We are also the foremost provider of end-to-end risk and analytics services that include quantitative support, front and middle office support, and regulatory and business process change management support to trading, risk management, regulatory and CFO functions at world's leading financial institutions. We also provide extensive support to banks in financial crime and compliance analytics. We are leaders in research support, and risk and analytics support, providing it to more than 75 global banks, 50 buy-side firms covering hedge funds, private equity, and asset management firms. Our research support enables coverage of over 3,300 stocks and 3,400 corporates and financial institutions globally. We support more than 15 bank holding companies in their regulatory requirements and submissions. We operate from 7 research centers in Argentina, China, India, and Poland, and across several time zones and languages.

About CRISIL Limited

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 United States (US), the United Kingdom (UK), Argentina, Poland, China, Hong Kong, Singapore, Australia, Switzerland, Japan and the United Arab Emirates (UAE).

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.

CRISIL Privacy Notice

CRISIL respects your privacy. We may use your contact information, such as your name, address, and email id to fulfil your request and service your account and to provide you with additional information from CRISIL. For further information on CRISIL's privacy policy please visit www.crisil.com/privacy





AI/ML offerings (Quantitative services)

CRISII An S&P Global Company

End-to-end AI/ML and advanced analytics services and solutions

Unlocking business value through insights generation

Reducing risk

CRISIL's

solutions

help financial

evolving AI/ML

requirements

institutions

worldwide

across the

value chain

manage

Improving product and operational efficiencies



Our AI/ML solutions

Data strategy



Collecting and preparing high-quality data, which includes data gathering from multiple sources, cleansing, normalisation and transformation

 OO · O
 Model development and testing

 O · O ·
 Choosing the right methods, imp

 Choosing the right methods, improving the data features, designing the model structure, and teaching the models using past data through libraries and frameworks



Data architecture and integration

Integrating AI/ML models into existing organisational infrastructure, including applications, databases, and other systems



Tracking model performance, detecting anomalies, retraining models, updating algorithms, validating, and addressing drift and bias issues

Cloud transformation and scalability

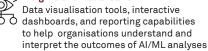
Supporting the cloud journey with a tailored offering to facilitate cloud strategy, cloud adoption, and cloud optimisation

Governance and compliance



Data privacy, security and regulatory compliance, including auditing, ethical implementation, and data access controls

Insights and visualisation



Current market trends

Robotic process automation **Digital transformation** Next best action Explainable AI Enhanced risk management Interactive chatbots Hyperpersonalisation Ethical Al

Natural language generation ESG solutioning

Our AI/ML use cases



Financial analysis and credit scoring

Financial data disambiguation, sentiment analysis, market forecasting, wealth management and investment strategies, and underwriting automation

Fraud detection and prevention

Pattern identification, anomaly detection, behavioural analysis, proactive mitigation, and rapid alert trigger



Customer service and relations

High-volume customer engagement, feedback handling, segmentation/profiling, and churn prediction



Risk assessment scenarios

Portfolio optimisation, financial reporting, investment strategy simulation, back-testing, risk assessment, and diversification strategies

Compliance and reporting



Automated reporting, compliance monitoring, regulatory oversight, exceptions flagging, controls management, data privacy, and audit trail tracking

ESG solutions

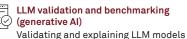


Vendor audit, automated extraction of ESG data, data enrichment, scenario analysis of portfolio, and customised dashboards

by assessing performance, accuracy and

metrics and benchmarking with fine-tuning

reliability through industry evaluation



Real-time monitoring and maintenance



DE

Portfolio optimisation through risk assessment for a leading US-based investment bank

- CRISIL helped generate periodic reports on markets using alternative data
- Customised projects and ad hoc requirements based on client requests
- Analysed historical performance data, built clean and transformed pipelines, and determined asset correlations, risk factors, and market conditions to balance risk and returns
- Reduced time required to produce analysis and reports by over 50%, and ensured zero error through optimisation as per risk tolerance levels
- Simulated stress testing scenarios and estimated value at risk (VaR)
- Comprehensively used advanced regression algorithms and statistical rules

Advanced ESG investing to incorporate ESG factors into investment decisionmaking for a global bank

- CRISIL used advanced AI/ML models to analyse ESG-related data, including sustainability reports, news articles and stakeholder sentiment for a global bank
- Developed robust hierarchical segmentation to evaluate environmental and social impact of investment opportunities
- Automated data creation, data cleaning, and data aggregation
- Developed multilevel customer segmentation
- The model was able to help the bank meet increasing investor demand for socially responsible investments and reduction in carbon footprint globally



Go-to-market strategy for the wealth management division of a leading UK bank

- CRISIL developed and employed a comprehensive methodology unifying business, data and systems architecture for the client
- Developed business process models for the sales team to have an effective client outreach strategy
- Conducted current state assessment of data, systems and surveys to build a customer 360-degree profile for enhanced profiling
- Defined target customer capabilities, and provided recommendations and actionable roadmap to cross-sell and upsell wealth products

We have decades of experience in helping financial institutions develop and validate responsible AI/ML models

End-to-end Al/ML vendor model validation as per Al model risk guidelines for a leading US bank

- Validated multiple AI/ML vendor transaction fraud models for various retail portfolios as per SR 11-7 and AI model risk guidelines
- Performed AI model risk assessment, vendor model testing, implementation testing, and prepared documentation
- Performed AI model bias and fairness testing, and assessment of various AI risk dimensions



Enterprise-wide comprehensive news and event-based trading algorithm for a leading US investment bank

- CRISIL developed an enterprise-wide tool to analyse news articles, corporate announcements, economic reports, and other events that impact financial markets
- Helped analyse relevant information and sentiment to identify trading opportunities and risks of specific news events
- Leveraged graph analytics and algorithms to provide richer and deeper context for prescriptive analytics and AI/ML applications to adjust trading strategies holistically
- Provided recommendations and actionable roadmap to cross-sell and upsell wealth products

Development of enterprise-wide credit-decisioning model using explainable AI/ML model for a global bank

- CRISIL helped a global bank develop explainable AI/MLbased credit-decisioning scoring models
- Performed feature engineering and handled unstructured data to improve efficiency and accuracy of the existing credit-decisioning process
- Key concerns such as model interpretability of ML algorithms were addressed with the help of algorithms such as LIME, ICE, and SHAP

Contact us

Mohit Modi Global Head of Data & Analytics mohit.modi@crisil.com

Anshuman Prasad Global Head of Risk Analytics anshuman.prasad@crisil.com Jose Ordonez Market Head, APAC jose.ordonez@crisil.com

About CRISIL Global Research & Risk Solutions (GR&RS)

CRISIL GR&RS is a leading provider of high-end research, risk and analytics services. We are the world's largest provider of equity and fixed-income research support to banks and buyside firms. We are also the foremost provider of end-to-end risk and analytics services that include quantitative support, front and middle office support, and regulatory and business process change management support to trading, risk management, regulatory and CFO functions at world's leading financial institutions. We also provide extensive support to banks in financial crime and compliance analytics. We are leaders in research support, and risk and analytics support, providing it to more than 75 global banks, 50 buy-side firms covering hedge funds, private equity, and asset management firms. Our research support enables coverage of over 3,300 stocks and 3,400 corporates and financial institutions globally. We support more than 15 bank holding companies in their regulatory requirements and submissions. We operate from 7 research centers in Argentina, China, India, and Poland, and across several time zones and languages.

About CRISIL Limited

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

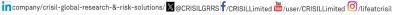
It is India's foremost provider of ratings, data, research, analytics and solutions with a strong track record of growth, culture of innovation, and global footprint.

It has delivered independent opinions, actionable insights, and efficient solutions to over 100,000 customers through businesses that operate from India, the United States (US), the United Kingdom (UK), Argentina, Poland, China, Hong Kong, Singapore, Australia, Switzerland, Japan and the United Arab Emirates (UAE).

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.

CRISIL Privacy Notice

CRISIL respects your privacy. We may use your contact information, such as your name, address, and email id to fulfil your request and service your account and to provide you with additional information from CRISIL. For further information on CRISIL's privacy policy please visit www.crisil.com/privacy





Credit and Lending Solutions



Credit and Lending Solutions

Accelerate your credit risk and lending transformation with CRISIL's automation tools, and credit and loan data analytics to streamline workflows

Leverage CRISIL's expertise in credit risk platforms and harness the potential of offshoring

The CRISIL advantage



Established partnership with S&P Global since 2005

|0|0 |0|0 Intelligent automation Full digitalisation of processes and systems



Rich experience 20+ years of experience in credit risk and lending offshoring



Strong talent with scalability Access to a global talent pool

By the numbers

- 10.000+ credit memos executed
 - 5.000+ risk rating scorecards reviewed and updated
- 15,000+ loans tracked and updated for covenant monitoring
 - 1.2m+ early warning indicators evaluated to ascertain red flags
 - 10+ regulatory MRAs and consent orders addressed from 2020

Services provided



Deal support

Originations, underwriting and reviews, and risk rating



Credit risk and monitoring support

Credit policy simplification, portfolio management, and problem recognition



Documentation and reporting

Loan documentation, regulatory reporting, deposit customer management, period reports, and process standardisation



Lending operations

Onboarding and booking, loan servicing, covenant and collateral operation, loan closing

— Portfolios covered					
Commercial	Commercial and industrial	Asset-based	Leverage	Healthcare	Financial institution
real estate		lending	lending	lending	lending
Residential	Wholesale	Not-for-profit	Energy	Consumer	SBA lending
lending	mortgage lending	lending	lending	lending	
Equipment	Vendor	Project	Trade	Environment/	Supply-chain
finance	finance	finance	finance	climate finance	finance



	Cost savings up to 50%	40+	global, regional and commercial bar
N	Enhanced credit and loan data quality	20+	leading investment banks
L T		100+	global buy-side firms
Ì	Reduced turnaround time	19	of largest bank holding companies
	Active surveillance support	4	exchanges/clearing houses
	Regulatory compliance	8	leading global insurers

Contact us

Amit Vora **Global Head of Credit & Lending Solutions** amit.vora@crisil.com

Jose Ordonez Market Head, APAC jose.ordonez@crisil.com

nercial banks

About CRISIL Global Research & Risk Solutions (GR&RS)

CRISIL GR&RS is a leading provider of high-end research, risk and analytics services. We are the world's largest provider of equity and fixed-income research support to banks and buy-side firms. We are also the foremost provider of end-to-end risk and analytics services that include quantitative support, front and middle office support, and regulatory and business process change management support to trading, risk management, regulatory and CFO functions at world's leading financial institutions. We also provide extensive support to banks in financial crime and compliance analytics. We are leaders in research support, and risk and analytics support, providing it to more than 75 global banks, 50 buy-side firms covering hedge funds, private equity, and asset management firms. Our research support enables coverage of over 3,300 stocks and 3,400 corporates and financial institutions globally. We support more than 15 bank holding companies in their regulatory requirements and submissions. We operate from 7 research centers in Argentina, China, India, and Poland, and across several time zones and languages.

About CRISIL Limited

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 United States (US), the United Kingdom (UK), Argentina, Poland, China, Hong Kong, Singapore, Australia, Switzerland, Japan and the United Arab Emirates (UAE).

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.

CRISIL Privacy Notice

CRISIL respects your privacy. We may use your contact information, such as your name, address, and email id to fulfil your request and service your account and to provide you with additional information from CRISIL. For further information on CRISIL's privacy policy please visit www.crisil.com/privacy



Data and Analytics Services





Data and Analytics Services

CRISIL provides end-to-end advisory and execution services to partner with financial services organisations across the data lifecycle, bringing comprehensive solutions to drive enterprise strategy and transformation

Driving optimised financial service processes with cutting-edge data and analytics technology

Current market trends







AI-powered alternative data ingestion







Generative AI

Edge computing for realtime data processing

Self-service reporting and analytics

Cloud adoption

ESG analytics

CRISIL core services

Data strategy

Designing and implementing a holistic data strategy that aligns with an organisation's key business drivers is crucial for optimising its data and analytics capabilities



Data governance and management

Establishing and implementing accountability for data enforced by the policies and standards used to govern and control data



Data architecture and integration

Designing and developing the infrastructure to integrate the business, data, and technology landscape



Cloud transformation

Supporting the cloud journey with a tailored offering to facilitate cloud strategy, cloud adoption and cloud optimisation



BI and MI reporting

Designing and implementing effective business and market intelligence reporting to identify trends, highlight areas of concern, and provide key performance indicators



Advanced analytics

Developing or enhancing analytics strategies and supporting in use case development and delivery across the analytics spectrum, utilising AI and ML to automate and enhance capabilities

Clients





Services to 55 +buy-side firms

Talent







150 +

US



1,200+ Analytics headcount globally

900+ India

150 +Europe

Accelerators

Phoenix Integration Tool



- Automated Dashboarding
- AI Adoption Framework

Key partnerships



Snowflake











Our team has decades of experience helping financial institutions navigate their toughest challenges through data-driven transformation



Alternative data ingestion solution for a financial services company

Developed key frameworks and accelerators to help identify opportunities for streamlining lineage using automation, **significantly improving data governance**



End-to-end automated solution for market data for an investment manager

Designed a workflow automation solution, significantly accelerating multiple ESG documentation processes



Data fabric enabled self-service platform for a global bank

Implemented Phoenix to manage large volumes of unstructured data and complex processes, including 25 asset classes, 30K entities, and 200K documents, **leading to ~50%** reduction in effort hours

Data lineage as part of the next-gen operating model for a global bank



Conceptualised, designed and developed an analytics solution for 15+ market data sources, **reducing processing efforts by 90%**

Fulkrum ESG workflow automation solution for a top investment management firm



Overhauled a client's existing architecture by using a standardised methodology to create a smart, unified, selfservice data structure that facilitates end-to-end integration of data pipelines, **enabling streamlined data operations and high-quality analytics**

Contact us

Mohit Modi Global Head of Data & Analytics mohit.modi@crisil.com Jose Ordonez Market Head, APAC jose.ordonez@crisil.com

About CRISIL Global Research & Risk Solutions (GR&RS)

CRISIL GR&RS is a leading provider of high-end research, risk and analytics services. We are the world's largest provider of equity and fixed-income research support to banks and buyside firms. We are also the foremost provider of end-to-end risk and analytics services that include quantitative support, front and middle office support, and regulatory and business process change management support to trading, risk management, regulatory and CFO functions at world's leading financial institutions. We also provide extensive support to banks in financial crime and compliance analytics. We are leaders in research support, and risk and analytics support, providing it to more than 75 global banks, 50 buy-side firms covering hedge funds, private equity, and asset management firms. Our research support enables coverage of over 3,300 stocks and 3,400 corporates and financial institutions globally. We support more than 15 bank holding companies in their regulatory requirements and submissions. We operate from 7 research centers in Argentina, China, India, and Poland, and across several time zones and languages.

About CRISIL Limited

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 United States (US), the United Kingdom (UK), Argentina, Poland, China, Hong Kong, Singapore, Australia, Switzerland, Japan and the United Arab Emirates (UAE).

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.

CRISIL Privacy Notice

CRISIL respects your privacy. We may use your contact information, such as your name, address, and email id to fulfil your request and service your account and to provide you with additional information from CRISIL. For further information on CRISIL's privacy policy please visit www.crisil.com/privacy





Climate risk solutions



Climate risk solutions

Unlock value through CRISIL's services

To stay on top of the sustainability agenda and better serve the evolving market, financial institutions need to apply emerging climate risk management regulations, guidelines, and best practices to key operational business functions, rather than at the enterprise level.



Risk assessment

CRISIL's world-class consulting teams conduct sector-wise and firm-wise analysis to determine the extent and probability of climate risks and losses associated with different businesses, and provide business-wise solutions to mitigate them.



Scenario analysis

We have expertise in enhancing models for climate risk adjustment and in performing scenario analysis, including credit risk and expected loss modelling, and probability-ofdefault adjustment analysis for the portfolio.



Data identification

We facilitate banks in their adoption of climate risk models by helping them find relevant and more accurate data, and data proxies.



Responsible investment

Our modelling capabilities enable a responsible investment agenda, and customisation and modification of the asset/ liability portfolio to ensure future investments attain the best forecast possible for climate value-to-risk ratio.



ton tollat 100

Model development and validation

Years of experience and modelling expertise allow CRISIL to develop accurate, precise, and customised models to incorporate climate risks in the existing risk management framework.



Disclosures

Our understanding of financial goals ensures they are aligned with regulations, particularly reporting requirements laid out by the Task Force on Climate-Related Financial Disclosures and the US Securities and Exchange Commission.



CRISIL's large talent pool of certified specialists is well equipped with domain knowledge across climate risk, financed emissions, scenario analysis, stress testing, climate data handling, credit risk analysis, and model risk management.



Our domain specialists are strategically positioned across the value chain, with expertise in global risk regulations, supervisory stress-test methodologies, and industry best practices.



Our global team of experts has curated implementation plans for various banks worldwide and under varied regulatory mandates.



We have a team of over 650 quant analysts, actuaries and consultants, complemented by more than 1,200 SMEs and 80 ESG and climate risk experts. They support over 30 banks and insurance companies, and more than 300 corporates.



We have a large global footprint, with ISO 27001-certified centres across regions — offshore centres in India, Poland, Argentina and China, and onsite delivery centres in London, New York, Zurich, Amsterdam, and Melbourne.

Client requirement Develop the bank's climate roadmap with an aim to align it wit regulatory expectations Integrate climate risk modelling in the bank's investment practices Outcomes achieved Ability to identify and pursue business opportunities	requirements	CRISIL set-up• A team of five SMEs, including a PhD, actuaries, and quant analysts, applied a holistic approach to physical and transition risk modelling for the bank's portfolioEffective risk profile transformationStreamlined policies and procedures	Climate model adoption case study
Client requirement • Develop a toolkit for the risk discovery and mitigation process, particularly with regard to climate risk, data privacy, inflation, cybersecurity, and Al/ML • Deep insights and actionable intelligence around climate risks	industry best practices; C- recommendations for in tactical and strategic th	CRISIL set-up • A team of climate risk experts, actuaries, and data scientists reviewed data, documents, internal reports, policies, and key Tier 1 models to identify ERM gaps and missing risks • volvement of elevel stakeholders enhancing to climate risk billaboration culture	ERM enhancement case study

Contact us

Anshuman Prasad Global Head of Risk Analytics anshuman.prasad@crisil.com

Jose Ordonez Market Head, APAC jose.ordonez@crisil.com

About CRISIL Global Research & Risk Solutions (GR&RS)

CRISIL GR&RS is a leading provider of high-end research, risk and analytics services. We are the world's largest provider of equity and fixed-income research support to banks and buy-side firms. We are also the foremost provider of end-to-end risk and analytics services that include quantitative support, front and middle office support, and regulatory and business process change management support to trading, risk management, regulatory and CFO functions at world's leading financial institutions. We also provide extensive support to banks in financial crime and compliance analytics. We are leaders in research support, and risk and analytics support, providing it to more than 75 global banks, 50 buy-side firms covering hedge funds, private equity, and asset management firms. Our research support enables coverage of over 3,300 stocks and 3,400 corporates and financial institutions globally. We support more than 15 bank holding companies in their regulatory requirements and submissions. We operate from 7 research centers in Argentina, China, India, and Poland, and across several time zones and languages.

About CRISIL Limited

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 United States (US), the United Kingdom (UK), Argentina, Poland, China, Hong Kong, Singapore, Australia, Switzerland, Japan and the United Arab Emirates (UAE).

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.

CRISIL Privacy Notice

CRISIL respects your privacy. We may use your contact information, such as your name, address, and email id to fulfil your request and service your account and to provide you with additional information from CRISIL. For further information on CRISIL's privacy policy please visit www.crisil.com/privacy

